

# **CLASS 411, EXPANDED, THREADED, DRIVEN, HEADED, TOOL-DEFORMED, OR LOCKED-THREADED FASTENER**

## **SECTION I - CLASS DEFINITION**

This class is the locus for the following types of fasteners when they are adapted for general use and are not sufficiently limited to use with special articles or structures as to require classification therewith:

- A. An anchoring-type or holding-type fastener which expands upon receiving a driven fastener or when driven by a tool;
- B. A tool driven externally threaded fastener (e.g., bolt, screw);
- C. A tool driven internally threaded fastener (e.g., nut);
- D. An impact driven fastener (e.g., nail, staple);
- E. A tool driven or discrete (i.e., not affixed to workpiece), headed, elongated-shank fastener adapted to be moved along its longitudinal axis into coaxial apertures in a workpiece, wherein the headed, elongated-shank fastener is secured by either (1) a deformable end (e.g., rivet), (2) means other than threads requiring rotation for engagement (e.g., Dzus-type or quarter-turn fastener), (3) pivotable securing means (e.g., toggle bolt), (4) retractable securing means (e.g., ball detent fastener), or (5) a separate retaining element; and
- F. A tool deformed or tool driven fastener (e.g., cotter pin) which is closely allied in use with the other fasteners of this class.

This class is also the locus for a threaded bolt (i.e., externally threaded fastener) or a threaded nut (i.e., internally threaded fastener), either singly or inter-threaded with one another, which bolt or nut, or a mating pair thereof, is not free to turn about the axis of its thread (i.e., its longitudinal axis), by virtue of being (A) combined with means which restrict its rotation relative to a coating structure, or (B) combined with means which prevent its rotation relative to its complementary nut or bolt, respectively, or (C) combined with means which both restrict its rotation as in (A) and prevent its rotation as in (B). The bolt and the nut, either single or together, are associated with a fastening function. This class also provides for devices (e.g., washers) which are used in conjunction with fasteners of this class and which perfects the fastening operation thereof.

This class additionally provides for those subcombinations (e.g., fastener heads) of its subject matter for which no other locus exists.

## **SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS**

If otherwise proper for this class, fasteners capable of either manual or tool operation (e.g., tacks) are placed in this class and not in Class 24.

### **SUBCLASSES**

#### **1 TORQUE RESPONSIVE NUT OR BOLT DRIVING CONNECTION:**

This subclass is indented under the class definition. Subject matter wherein a holding device is either (a) provided with a driving section which is disconnectable from the holding device when a twisting force in excess of a predetermined limit is applied thereto or (b) yieldably urged into engagement with a cooperating element and moves into a noncooperating position upon the application of excessive torque.

SEE OR SEARCH THIS CLASS, SUBCLASS:

402+, for externally threaded fasteners (e.g., screws and bolts, etc.) having specific head driving structure.

#### **2 Frangible connection:**

This subclass is indented under subclass 1. Subject matter wherein the holding device is joined to the driving section by a destroyable member or weakened portion which ruptures upon the application of excessive torque.

SEE OR SEARCH THIS CLASS, SUBCLASS:

39+, for a holding device or anchor provided with frangible portion.

#### **3 Between concentric elements:**

This subclass is indented under subclass 2. Subject matter wherein the holding device and the driving section are coaxial.

**4 Shear pin connecting means:**

This subclass is indented under subclass 3. Subject matter wherein the holding device and the driving section are joined together by a separate element usually disposed in aligned apertures therein which shears upon the application of torque in excess of a predetermined limit.

**5 Axially displaced:**

This subclass is indented under subclass 3. Subject matter wherein the holding device and the driving section are arranged in axially spaced concentric relationship with respect to each other and are joined together by the member or weakened portion.

**6 Resilient connection:**

This subclass is indented under subclass 1. Subject matter wherein a yieldable connection is provided between the holding device and the driving section by a connecting means carried by or formed on either the device or the section which connecting means either is capable of flexing within its elastic limit or includes a yieldable biasing means which urges the connecting means to an operative position, whereby the connecting means is movable to an inoperative, disconnect position upon the application of excessive torque.

**7 Racket:**

This subclass is indented under subclass 6. Subject matter wherein the connecting means comprises a first tooth or toothlike member located on either the holding device or driving section and a second tooth or toothlike member, or other structure located on either the holding device or the driving section, the second tooth, member, or structure being yieldably engageable and relatively movable with the first tooth or toothlike member.

**8 WITH MEANS TO INDICATE APPLICATION OF PREDETERMINED STRESS-STRAIN:**

This subclass is indented under the class definition. Subject matter wherein a holding device includes a self-contained part which functions to permit measuring of, or to denote attainment or loss of a desired degree of, tension, compression, or torque in the device.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

402, for externally threaded fasteners (e.g., screws, bolts, etc.) provided with specific head driving structure.

SEE OR SEARCH CLASS:

73, Measuring and Testing, appropriate subclasses for methods of measuring and testing stresses or strains in a bolt, and for measuring and testing apparatus not entirely a part of the fastener in situ, particularly subclasses 141+ for means for measuring a direct push or pull on a fastener.

116, Signals and Indicators, subclasses 200+ for indicator devices not entirely a part of a fastener in situ to indicate tension or compression thereon.

340, Communications: Electrical, subclass 668 for electric signaling devices not entirely a part of a fastener in situ responsive to and controlled by the tension or stress in the fastener.

**9 Axially deformable member or portion:**

This subclass is indented under subclass 8. Subject matter wherein the self-contained part includes means having a dimension which lies substantially parallel to the axis along which the holding device is advanced, which means is responsive to and indicative of a change in the loading condition of the holding means by variations in said dimension.

**10 Deformable washer:**

This subclass is indented under subclass 9. Subject matter wherein the self-contained part is in the form of an annular or cylindrical member which is altered in height to indicate the attainment, or loss of a desired degree of tension, compression, or torque.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

531+, for washers, per se.

**11 Resilient:**

This subclass is indented under subclass 10. Subject matter wherein the annular or cylindrical member is axially resilient to allow an elastic reduction in height.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

544, for axially resilient washers, per se.

**12 Coil spring:**

This subclass is indented under subclass 11. Subject matter wherein the resilient member is in the form of a helically wound element which is axially compressed to indicate the attainment of a desired degree of tension, compression, or torque.

**13 Color indicator:**

This subclass is indented under subclass 8. Subject matter wherein the self-contained part carries a distinct color producing a visual indication of the measuring attainment or loss of a desired degree of tension, compression, or torque in the device.

**14 Including gauge means:**

This subclass is indented under subclass 8. Subject matter wherein the self-contained part carries or contains a discrete means for measuring the degree of tension, compression, or torque in the device.

**14.5 TENSIONED ALONG THE LONGITUDINAL AXIS BY A COAXIAL FORCE APPLYING DEVICE (E.G., MECHANICAL TENSIONER):**

This subclass is indented under the class definition. Subject matter wherein the fastener in which an apparatus applies a stress or pull parallel to an imaginary line through the longest dimension of the bolt, screw, nail, rivet, etc. and the apparatus is then removed.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

1+, for a torque responsive nut or bolt driving connection.

SEE OR SEARCH CLASS:

254, Implements or Apparatus for Applying Pushing or Pulling Force, subclass 29 for tie rod tensioner.

**15 HAVING SEPARATE EXPANDER MEANS:**

This subclass is indented under the class definition. Subject matter wherein the longitudinal extent of a holding device or an anchor can be

increased and means are provided to effect this increase in dimension.

- (1) Note. The increasing means of this subclass includes but is not limited to a wedge-shaped mandrel, fluid pressure, a screw (tapered or straight shanked) for applying and expanding force to the holding device, cooperating sloped faces, etc.

SEE OR SEARCH CLASS:

52, Static Structures (e.g., Buildings), subclasses 157+ for an auger anchor insertable in the ground; and subclasses 698+ for an anchor embedded in a settable material, connected to a subsurface member or conformed to a specially modified base, and see the note in subclass 698 for the line.

405, Hydraulic and Earth Engineering, appropriate subclasses for expanding anchors or holding devices used with tunnels. As between Classes 411 and 405, Class 405 takes a rock bolt having means to grout it in place or earth anchors combined with retaining walls or like structures which are desired to be secured to the earth. In addition, Class 405 takes rock bolts combined with specific roof-supporting systems or such bolts combined with support plates where the plates have a roof support, e.g., load-bearing features, hangers, peculiar terrestrial coacting features, etc. Class 405 is the repository for the support plates, per se, which are associated with rock bolts. Class 411 takes expanding anchors, per se, even though they are solely disclosed as being rock bolts or such anchors associated with nominal roof support plates.

**16 Helical anchor:**

This subclass is indented under subclass 15. Subject matter wherein the holding device or anchor includes a wound means forming a sleeve.

SEE OR SEARCH CLASS:

52, Static Structures (e.g., Buildings), subclasses 705+ for a socket type anchor having a helical feature on its

exterior surface, and see the note in subclass 698 for the line.

**17 Mates with mandrel thread:**

This subclass is indented under subclass 16. Subject matter wherein the means to effect the dimension increase includes a member having a helical rib formed on its exterior surface which member is inserted into and causes expansion of the spirally wound sleeve.

**18 With wedge-shaped expander:**

This subclass is indented under subclass 16. Subject matter wherein a tapered member is provided for expanding the spirally wound sleeve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 24+, for an anchor or holding device provided with a double wedge oppositely acting expander.
- 44+, for a sleeve type anchor or holding device having a tapered expander.
- 75+, for an anchor or holding device provided with sliding wedge surfaces.

**19 Fluent pressure actuated:**

This subclass is indented under subclass 15. Subject matter wherein the holding device or anchor has a chamber therein, and expansion is caused by fluent pressure applied within the chamber.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 391, for an externally threaded fastener element (e.g., a bolt or screw) having fluent pressure separating means.
- 434, for an internally threaded fastener element (e.g., a nut) having plural moveable parts moved by fluent pressure.

**20 Explosive:**

This subclass is indented under subclass 19. Subject matter wherein the fluent pressure is created by the detonation of an explosive charge.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 440+, for an impact driven fastener having explosive driving means.

532, for a washer provided with explosive release means.

**21 Having securing element projecting through aperture in sleeve:**

This subclass is indented under subclass 15. Subject matter wherein the holding device or anchor includes a member which bounds the remainder of the device or anchor and which is provided with a port through which a portion of the remainder of the device or anchor extends to effect or enhance the securement of the device or anchor in place.

**22 Deformable element:**

This subclass is indented under subclass 21. Subject matter wherein the portion of the remainder of the device or anchor includes means which is bent or otherwise reshaped to bring it into an operative position to effect or enhance securement of the holding device or anchor.

- (1) Note. The term "deformable element" of this and the indented subclass is inclusive of a mass of flowable material, including granular material, which is caused to flow in a desired fashion when a force is applied to it.

**23 Flowable mass:**

This subclass is indented under subclass 22. Subject matter wherein the means which is reshaped includes a body composed of either (a) a plastically yieldable material, the overall configuration of which is altered when a force is applied to the body or (b) a plurality of constituent particles which are free to move relative to each other when a force is applied to the body.

**24 Oppositely acting double wedge expander means:**

This subclass is indented under subclass 15. Subject matter wherein the anchor or device includes a pair of oppositely disposed tapered elements which increase the circumferential extent of the holding device or the anchor by their relative movement axially toward or away from each other.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
 44+, for an anchor or holding device in the form of a sleeve and tapered expander.  
 75+, for an anchor or holding device having sliding wedge surfaces.
- 25 Outwardly moving:**  
 This subclass is indented under subclass 24. Subject matter wherein the tapered elements are disposed within the holding device or anchor and effect expansion of the device or anchor by moving away from each other.
- 26 Both wedges provided with thread cooperating means:**  
 This subclass is indented under subclass 24. Subject matter wherein a threaded shaft extends between the tapered elements, and each of the elements either are provided with thread means which coact with the shaft or are engaged by a driving member which is provided with shaft coacting thread means such that upon rotation of the shaft the tapered elements move towards or away from each other.
- 27 Having rotation preventing means:**  
 This subclass is indented under subclass 24. Subject matter wherein cooperating means are provided on one of the tapered elements and on the remainder of the anchor or the holding device to prevent relative rotation therebetween.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
 49+, for an anchor or device in the form of a sleeve and tapered expander having rotation prevention means.
- 28 Groove and follower:**  
 This subclass is indented under subclass 27. Subject matter wherein a tapered element and the remainder of the holding device or the anchor are each provided with either a groove means or a protuberance means which cooperate to prevent those members from turning relative to each other when the tapered elements move toward or away from each other.
- 29 With hold forming means:**  
 This subclass is indented under subclass 15. Subject matter wherein the anchor or holding device is provided with means to form an anchor or holding device receiving aperture in a medium within which the anchor is to be secured or in the elements or portions to be secured together.
- SEE OR SEARCH CLASS:  
 52, Static Structures (e.g., Buildings), subclasses 155+ for a device for that class having means to penetrate the earth.
- 30 Formed on expandible sleeve:**  
 This subclass is indented under subclass 29. Subject matter wherein the anchor or holding device includes a substantially cylindrical sleeve which has the aperture forming means carried at one end thereof.
- 31 Serrated end:**  
 This subclass is indented under subclass 30. Subject matter wherein the aperture forming means is in the form of sharp teeth peripherally arranged about the end of the sleeve.
- 32 Plural expandible segments or sections:**  
 This subclass is indented under subclass 15. Subject matter wherein the anchor or holding devices includes either (a) a single portion or zone, composed of a plurality of separate, expandible members, which portion or zone can have its circumferential extent altered or (b) a plurality of spaced portions or zones each of which can have its circumferential extent altered.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
 432+, for multipart moveable internally threaded fastener element (e.g., nuts).
- 33 Identical segments:**  
 This subclass is indented under subclass 32. Subject matter wherein the plurality of separate, expandible members are duplicates.
- 34 Bulged by axially contracting ends:**  
 This subclass is indented under subclass 15. Subject matter wherein the holding device or anchor is expanded by moving the ends thereof

toward each other so as to collapse a sleeve structure thereof.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

57.1+, for an anchor or holding device in the form of a tapered expander with a slotted sleeve or in 63+, with a plural sectioned sleeve.

- 35 Having wedge-shaped section acting in slot:**  
This subclass is indented under subclass 35. Subject matter wherein the holding device or anchor is in the form of a generally tubular member having an elongated opening in a wall thereof and including a portion having tapered edge surfaces adjacent an end of the elongated opening which act against the side edges of the elongated opening to facilitate bulging of the sleeve as the ends thereof are axially contracted.
- 36 Twistable sleeve:**  
This subclass is indented under subclass 34. Subject matter wherein the holding device or anchor is in the form of a generally tubular member one end of which is caused to turn relative to its other end when the member is bulged.
- 37 Bulged portion having additional gripping means:**  
This subclass is indented under subclass 34. Subject matter wherein the holding device or anchor includes means carried by and in addition to the expanded portion which means is forced into penetrating or frictional engagement with a part into which the holding device or anchor is inserted.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
71+, for an anchor or holding device in the form of a tapered expander and a sleeve having external gripping means.  
451.1+, for an impact driven fastener having integral locking means on its shank.
- 38 Bulged portion including bend line or reduced section:**  
This subclass is indented under subclass 34. Subject matter wherein the holding device or anchor is provided either with a deformed area

or area having a decreased dimension such that during movement of ends toward each other expansion occurs at these areas.

- 39 Frangible member:**  
This subclass is indented under subclass 15. Subject matter wherein a weakened area is provided on the holding device or anchor to facilitate its separation into discrete parts when sufficient force is applied.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
476, for a multiple prong impact driven force fastener having a frangible portion.
- 40 Frangibly connected expander:**  
This subclass is indented under subclass 39. Subject matter wherein a connection between the expander element and the remainder of the holding device or anchor defines a weakened area which fractures in response to a predetermined force.
- 41 Projecting outwardly from head:**  
This subclass is indented under subclass 40. Subject matter wherein the holding device or anchor includes a head end opposite an insertion end thereof and wherein the expander projects axially outwardly.
- 42 Sleeve including weakened portion:**  
This subclass is indented under subclass 39. Subject matter wherein the holding device or anchor comprises a substantially tubular element which includes a weakened area which fractures in response to a predetermined force.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
449, for an impact driven fastener provided an axially collapsible section provided to secure the fastener.
- 43 Frangible mandrel:**  
This subclass is indented under subclass 39. Subject matter which includes a member for moving an expander element wherein the member is formed with a pull portion which is connected to the remainder of the member by a weakened section which fractures upon the application of a predetermined force thereto.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
 361, for a headed fastener provided with nonexpanded deformed collar having a frangible mandrel.  
 476, for a multiple prong impact driven fastener provided with frangible portion.
- 44 Including sleeve and distinct tapered expander (e.g., anchor bolt type):**  
 This subclass is indented under subclass 15. Subject matter wherein the holding device or anchor comprises a sleeve in the form of a tubular element having a bore which is engaged by an expander having a wedging surface to effect expansion of the tubular element.
- 45 And means to captively retain expander:**  
 This subclass is indented under subclass 44. Subject matter wherein means are provided for holding the expander in assembled relationship with the holding device or anchor prior to expansion thereof.
- 46 Follower captive within groove:**  
 This subclass is indented under subclass 45. Subject matter wherein the expander and the holding device or anchor are provided with mating protuberance and slot means having closed ends whereby the slot means act to hold the expander in the assembled condition.
- 47 Bridge-type retainer:**  
 This subclass is indented under subclass 45. Subject matter wherein the means for maintaining the expander in assembled relationship comprises a section of material spanning an open end on the holding device or anchor.
- 48 Tongue-type retainer:**  
 This subclass is indented under subclass 45. Subject matter wherein the means for holding the expander in assembled relationship comprises an inwardly extending projection carried by the holding device or anchor with the innermost extremity thereof being unattached.
- 49 Relative rotation preventing means:**  
 This subclass is indented under subclass 44. Subject matter wherein means are provided for preventing rotative movement between the sleeve and the expander.
- 50 Guide and follower:**  
 This subclass is indented under subclass 49. Subject matter wherein the expander and the sleeve are each provided with either protuberance means or cooperating means to restrain the protuberance in a rectilinear fashion.
- 51 Splines:**  
 This subclass is indented under subclass 50. Subject matter wherein the guide and protuberance means are in the form of a plurality of grooves and relatively long, narrow ribs mating with said grooves.
- 52 Follower defined by corners of polygonal element:**  
 This subclass is indented under subclass 50. Subject matter wherein either the expander or a portion of the sleeve is of multisided cross section, and a corner of said cross section acts as the protuberance means.
- 53 Expander type:**  
 This subclass is indented under subclass 50. Subject matter wherein either the cooperating means or the protuberance means includes wedging surfaces which effect or aid in the expansion of the sleeve.
- 54 Expansible element moved relative to stationary expander:**  
 This subclass is indented under subclass 44. Subject matter wherein expansion is effected by the expander being held in a fixed position as the sleeve is axially moved relative thereto.
- 54.1 Spread by pressing element over initially inserted expander (e.g., push type):**  
 This subclass is indented under subclass 54. Subject matter in which the movement of the tubular member dilates around the already installed wedging surface.
- 55 Threaded expander:**  
 This subclass is indented under subclass 44. Subject matter which includes a mover element wherein the mover element activates the expander by means of threaded engagement therebetween.

- 56 Stepped expander:**  
This subclass is indented under subclass 44. Subject matter wherein the expander includes a plurality of sections of progressively increasing diameters to effect varying degrees of expansion of the sleeve.
- 57.1 Slotted sleeve spread by tapered expander:**  
This subclass is indented under subclass 44. Subject matter wherein an elongated, narrow aperture is formed in the tubular element then dilated by the wedging surface.
- 58 Both ends slotted:**  
This subclass is indented under subclass 57.1. Subject matter wherein the sleeve is provided with an elongated, narrow aperture at each of its ends.
- 59 Slot spaced from ends:**  
This subclass is indented under subclass 57.1. Subject matter wherein the elongated, narrow aperture has its ends axially spaced from respective ends of the sleeve.
- 60.1 Expander moved into stationary sleeve (i.e., pull type):**  
This subclass is indented under subclass 57.1. Subject matter wherein the slotted sleeve in which the wedging surface contacts the tubular member in the direction that the tubular member is inserted in an opening.
- 60.2 Threaded expander:**  
This subclass is indented under subclass 60.1. Subject matter wherein the expander into the slotted sleeve in which the wedging surface has a projecting helical rib that matches with a fastener rib.
- 60.3 Including a hinge or hinge-like portion:**  
This subclass is indented under subclass 60.1. Subject matter wherein the slotted sleeve in which a portion of the sleeve has a jointed or flexible piece which rotates away from the axis of the sleeve upon actuation of the expander.
- 61 Folded blank type:**  
This subclass is indented under subclass 57.1. Subject matter wherein the sleeve is formed from a single sheet of material bent into shape with free edges of the sheet defining the sides of the elongated narrow aperture.
- 62 Slot angularly related to sleeve axis:**  
This subclass is indented under subclass 57.1. Subject matter wherein the elongated, narrow aperture is inclined with respect to the longitudinal axis of the sleeve.
- 63 Plural-sectioned sleeve:**  
This subclass is indented under subclass 44. Subject matter wherein the sleeve comprises a plurality of discrete, laterally arranged sections.  
  
SEE OR SEARCH THIS CLASS, SUBCLASS:  
432+, for multipart internally threaded fastener elements (e.g., nuts).
- 64 Having section retainer:**  
This subclass is indented under subclass 63. Subject matter wherein retainer means is provided for securing the sections together.
- 65 Ring or sleeve type:**  
This subclass is indented under subclass 64. Subject matter wherein the retainer means is in the form of a ring or sleeve which extends circumferentially of the sections.
- 66 Destructible:**  
This subclass is indented under subclass 65. Subject matter wherein the ring or sleeve is destroyed during expansion of the sleeve.
- 67 Bight type:**  
This subclass is indented under subclass 64. Subject matter wherein the retainer means comprises a strap element having its ends secured to the respective sections.
- 68 Tongue and groove:**  
This subclass is indented under subclass 64. Subject matter wherein the retainer means comprises a projection on one section received in a corresponding recess in an adjacent section.
- 69 Expander or sleeve extruded during expansion:**  
This subclass is indented under subclass 44. Subject matter wherein material of the expander or of the sleeve is caused to plastically flow during relative axial movement between the expander and sleeve.



**70 Expander having integral pull stem:**

This subclass is indented under subclass 44. Subject matter wherein the expander includes an elongated section as a unitary part thereof to be gripped by puller means for moving the expander relative to the sleeve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

501, for hollow rivets, per se.

**71 Sleeve having external gripping means:**

This subclass is indented under subclass 44. Subject matter wherein the sleeve is provided with gripping means on its exterior surface which is adapted to engage walls of a hole in a part into which the sleeve is inserted which gripping means prevents rotative or axial movement of the sleeve.

**72 Circumferential rib:**

This subclass is indented under subclass 71. Subject matter wherein the gripping means comprises a protuberance which extends around the sleeve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

455, for an impact driven fastener provided with integral locking means in the form of a circumferential rib on its shank.

**73 And longitudinal rib:**

This subclass is indented under subclass 72. Subject matter wherein the gripping means comprises the combination of a circumferential protuberance and a protuberance extending axially of the sleeve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

452+, for an impact driven fastener provided with integral locking means in the form of a longitudinal rib on its shank.

**74 Struck from sleeve:**

This subclass is indented under subclass 71. Subject matter wherein the gripping means is formed by being severed and bent out from the walls of the sleeve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

466+, for a multiple prong fastener formed by cutting and forming prongs from sheet metal material.

**75 Relatively sliding wedge surfaces:**

This subclass is indented under subclass 15. Subject matter which includes a holding device or anchor having a tapered surface thereon engaged by a mating surface on a second member wherein relative axial movement between the two surfaces results in a change in the transverse dimension of the device or anchor.

**76 Wedge received in transverse slot in holding device or anchor:**

This subclass is indented under subclass 75. Subject matter wherein the second member is disposed within a longitudinal slot in the holding device or anchor.

**77 Double-faced wedge:**

This subclass is indented under subclass 76. Subject matter wherein the second member includes a pair of opposed tapered surfaces which mate with surfaces on the holding device or anchor to produce expansion in laterally opposite directions.

**78 Having wedge retainer means:**

This subclass is indented under subclass 75. Subject matter wherein discrete means are provided for securing the second member in assembled relationship with the holding device or anchor.

**79 Wedge surfaces act in single lateral direction:**

This subclass is indented under subclass 75. Subject matter wherein the second member includes a single tapered surface cooperating with a surface on the holding device or anchor to cause a change in dimension in a single lateral direction.

**80 Including discrete activating means for wedge:**

This subclass is indented under subclass 75. Subject matter wherein distinct means are provided for moving the second member relative to the holding device or anchor in order to produce a wedging effect.

**80.1 Comprising a head and expandable portions spread by fastener (e.g., drywall anchor):**

This subclass is indented under subclass 15.

Subject matter wherein the expander wherein the enlargement or related structure at one end is connected to a sleeve-type section having a longitudinal slot from the enlargement end to the end of the sleeve in which the sleeve swells via the bolt, screw, nail, etc.

**80.2 Three or more expandable portions:**

This subclass is indented under subclass 80.1.

Subject matter wherein the head and legs expandable by a fastener in which the sleeve has more than one longitudinal slot.

**80.5 Sleeve type (headless) with longitudinal slot, slit, or split expanded by fastener:**

This subclass is indented under subclass 15.

Subject matter wherein the expander which is a tubular element that has a narrow channel along the longitudinal axis.

**80.6 Sleeve threaded:**

This subclass is indented under subclass 80.5.

Subject matter wherein the sleeve with slot which includes a projecting helical rib designed to cooperatively receive an engaging rod.

**81 THREADED FASTENER LOCKED TO A DISCREET SUBSTRUCTURE (E.G., PLATE, RAIL, WHEEL):**

This subclass is indented under the class definition. Device comprising a fastener in the nature of a threaded bolt or a threaded nut, or an interthreaded bolt and nut, and means for either preventing or limiting the turning of the bolt or the nut, or both of them, about its longitudinal axis relative to a claimed substructure (e.g., a base, a panel, a surface, an art device or, more generally, a workpiece) with which one or the other, or both, is associated.

- (1) Note. The substructure is involved with the bolt or the nut in performing a fastening function; for example, the substructure may be the recipient of an object which is attached to it by the bolt or nut, or the bolt or nut may be serving to fasten two or more substructures together, and so forth, in some instances the rotation restricting means, or a part thereof,

is formed integrally with the substructure.

- (2) Note. The substructure may not be claimed; however, for purposes of classification herein, it should be treated as being present if it performs an indispensable function in restricting the rotation of the bolt or the nut.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 190+, for a threaded bolt and nut and means for coupling them to one another against relative rotation.

SEE OR SEARCH CLASS:

- 238, Railways: Surface Track, subclass 262 for a railway track having one or more rails and wherein, at a butt joint between two sections of a rail, at least one splice bar is provided and further wherein bolts and nuts, and means for locking them against rotation, are included for connecting the splice bar to the abutting rail sections. While this and the indented subclasses take such structure of the splice bar or rail section as relates to the locking thereto against rotation of one or more bolts or nuts utilized in joining a splice bar to one or more rail sections, the inclusion of, for example, a second, parallel rail, a tie, a tieplate, a roadbed feature, etc., is sufficient to require classification in Class 238.

- 403, Joints and Connections, appropriate subclasses for connections between two or more members which involve greater specificity of the members than merely the manner in which they are adapted to serve as the coacting substructure for restricting the rotation of one or more bolts or nuts which are included in the connection.

**82 MADE, MODIFIED, OR PREPARED FOR SETTABLE MATERIAL:**

This subclass is indented under subclass 81. Device wherein the means comprises or includes a quantity of a substance which is hardenable from a soft or flowable, as-applied state into a state in which it serves to affix, or assist in affixing, a bolt or a nut, and, in some

instances, one or more additional elements that are associated with the bolt or nut, to a substructure.

- (1) Note. Exemplary of the substances are (a) adhesives for exerting a force which tends to keep two or more parts from separating such as (1) a flowable as applied but air hardenable material in the nature of a glue, (2) a normally hard but heat-softenable and subsequently rehardenable material in the nature of solder, or (3) a predisposed film or layer of material which, while essentially set up by the time of its use, remains tacky on its surface, (b) compositions such as weld rod or a chemical solvent which, with or without, respectively, the assistance of heat, molecularly intermingle with and unite two or more parts, and (c) a material which may be flowable when applied but which undergoes an increase in volume upon setting up and thus forces two or more parts into relatively rigid engagement with one another.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 171, for a threaded fastener (i.e., a bolt or nut) and means for restricting the rotation thereof relative to a coacting substructure wherein the means comprises the adapting of the bolt or nut to be fused directly to a substructure (i.e., without the use of additional material) (e.g., a weld nut).
- 257, for a threaded bolt and nut and means for coupling them against relative rotation wherein the means includes material which may be a metallic coating or a quantity of fusible metal.
- 258, for the coupled bolt and nut mentioned in the reference to subclass 257 above, but wherein the means includes a settable material.
- 376, for a headed fastener with a nut, washer, securing means or cap and wherein the element which is in addition to the fastener is a cap which is attachable by fusion bonding.

#### **82.1 Injected after fastener placement:**

This subclass is indented under subclass 82.  
Subject matter wherein the settable material

which is forced into a space surrounding a nail, bolt, screw, etc. after insertion.

#### **82.2 Adhesive coating:**

This subclass is indented under subclass 82.  
Subject matter wherein the settable material which is applied to the exterior surface of a nail, bolt, screw, etc.

#### **82.3 Adhesive encapsulated:**

This subclass is indented under subclass 82.  
Subject matter in which the settable material is in the form of a gelatinous or membranous envelope, pill, lozenge, tablet, capsule, ampoule, ampule, etc.

#### **82.5 TEMPERATURE SENSITIVE OR RESPONSIVE:**

This subclass is indented under the class definition. Fastener in which the amount of heat generated during torquing or driving causes a change, in some cases detectable, in the bolt or nail.

#### **84 Prefabricated assembly comprising strip or sheet member carrying plural similar fasteners:**

This subclass is indented under subclass 81.  
Device wherein the other element, or at least one of a plurality thereof, comprises a member which either has a significant longitudinal dimension (e.g., a channel) or else consists primarily of a planar surface (e.g., a plate) and which has connected thereto, in a manner which restricts their rotation relative to the member, a plurality of either nuts (usually) or bolts, the member and its nuts or bolts forming an assembly whereby the attachment of the member to a substructure serves to fasten the plurality of nuts or bolts thereto.

- (1) Note. It is commonplace in the art of this subclass to provide for a limited amount of movement of the nuts or bolts relative to the member, the purpose ordinarily being to enable a more precise alignment with their complementary bolts or nuts.

#### **85 Including element for holding fasteners against separation from member:**

This subclass is indented under subclass 84.  
Device wherein the assembly is provided with one or more second, other (i.e., additional) ele-

ments for assuring that the nuts or bolts cannot move away from their rotation restricting relationship with the member.

- (1) Note. A single additional element may suffice to hold a plurality of nuts or bolts to the member, or, in the alternative, each nut or bolt may require such an element. On the other hand, the holding of the nut or bolt to the member may require the cooperation of a set of two or more, dissimilar, additional elements, and, as in the previous example, one such set may hold a plurality of nuts or bolts to the member, or each nut or bolt may require such a set of elements.

**86 Including a series of elements, one element restricting two fasteners of a plurality, and the remainder each restricting one fastener:**

This subclass is indented under subclass 81. Device wherein the means comprises a plurality of elements, serially arranged more or less parallel to an outwardly facing surface of the substructure, one of the plurality of elements serving to restrict two bolts or nuts against rotation, and another, or each other, of the plurality of elements serving to restrict one other bolt or nut against rotation.

- (1) Note. While the other element, or each of them, receives the shank of one bolt and engages the head of another (usually adjacent) bolt, or a nut on that bolt, the one element must engage the heads of two (usually adjacent) bolts, or the nuts on those bolts. In order to engage the bolt heads or nuts, the element may be integrally so configured, or it may utilize an auxiliary portion to furnish the engagement with one of the two bolt heads or nuts; in the latter situation, the auxiliary portion may be hinged to its element, or it may be separable from its element and attachable thereto when utilized for its intended purpose.

**87 Elongate member extending between and interlocking plural bolts and nuts:**

This subclass is indented under subclass 81. Device wherein the other element, or at least one of a plurality thereof, comprises a member which has a longitudinal dimension greatly in excess of any of its other dimensions (e.g., a

bar, rod, strap, wire) and which spans the distance between, and is held in engagement with, two or more bolts or nuts, thus preventing relative rotation of any of the bolts or nuts which it interconnects.

- (1) Note. The member, in use, may retain the primarily rodlike configuration of the material from which it was made, or it may be looped, reversely bent, etc., which shaping frequently is for the purpose of engaging more than one flat side of a bolt head or a nut.

**88 Member engages inwardly facing surface and a flat side of bolt head or nut:**

This subclass is indented under subclass 87. Device wherein the member is so located as to engage the substructure-confronting surface of the head of, or of a nut on, one or more of the bolts, and wherein the member is provided with an abutment or related structure for engaging at least one of the heads or nuts on a flat side thereof.

**89 Member extending between plural fasteners and restricting the rotation thereof in one direction more than the other (e.g., pawl and ratchet):**

This subclass is indented under subclass 81. Device wherein the other element, or at least one of a plurality thereof, comprises a member which extends between two or more bolts or nuts and engages them in such a manner that rotation of the bolt or nut in one direction (e.g., unthreading) can be accomplished only by either the application of an excessive force or the disengagement of the member, or a portion thereof, from the bolt or nut, whereas rotation in the opposite direction e.g., threading) requires little, if any, more force than would be the case if the member was not there.

- (1) Note. Exemplary of the types of member-to-bolt-or-nut engagement are: (a) the member may engage merely a corner of a flat-sided bolt head or nut; (b) the bolt, bolt head or nut may be formed with one or more radial projections for engagement by the member; (c) the bolt head or the nut may be formed with an axial extension which carries one or more member-engaging projections; or (d) there may be present an additional

element which is coupled against rotation to the bolt or nut and which includes one or more member-engaging projections.

- (2) Note. The member-engaging projections of (d) of (1) Note may be in the nature of a ratchet, in which event the member functions as a pawl.

**90 Member extending between and engaging flat formed on side of each of a plurality of flat sided bolts or nuts (e.g., side lock):**

This subclass is indented under subclass 81. Device wherein the other element, or at least one of a plurality thereof, comprises a member in the nature of either a single piece of material or a plurality of pieces related in some fashion to one another, which member is positioned in such a manner that a principal surface thereof occupies a plane which parallels, or nearly parallels, that surface of the substructure with which it is in a facing relationship, and wherein the member includes a portion (e.g., an arm or lip extending normally to the principal surface of the member) for making contact with one or more planar regions formed on the exterior of, and extending parallel to the principal axis of, each of a plurality of bolts or nuts.

- (1) Note. In the instance of a bolt, the planar region ordinarily is located on the head, rather than the shank.

**91 And element on opposite face of substructure restricting rotation of a cooperating nut or bolt:**

This subclass is indented under subclass 90. Device provided with a second, other (i.e., an additional) element which faces a region of the substructure that is opposite to the region faced by the member, and which element limits the turning of (a) a nut which is complementary to a bolt whose turning is limited by the member or (b) a bolt which is complimentary to a nut whose turning is limited by the member.

- (1) Note. Usually, the element is similar in appearance to the member.
- (2) Note. The bolts may each enter the substructure from one face thereof, or one or more may enter from one face and

another one or more may enter from the opposite face.

**92 Having plural openings or notches engaging a bolt or nut on two sides:**

This subclass is indented under subclass 90. Device wherein those portions of the member which engage the planar regions of the bolts or nuts are the radially inwardly facing edges or walls of two or more passages through the member, which passages are so located as to be either (a) entirely within the boundaries of the member or (b) along a boundary thereof and thus having a periphery which is not a closed figure, and wherein the edge or wall engages at least two of the planar regions of each bolt or nut.

**93 Having plural parts, one of which engages the inwardly facing surface of a bolt head or nut:**

This subclass is indented under subclass 92. Device wherein the member consists of at least two coacting pieces, one or more of which has at least one area which is contacted by the inwardly facing (i.e., the working) surface of at least one of the bolt heads or nuts.

- (1) Note. In the instance of a bolt which is provided with both a primary and a secondary nut (i.e., a double nut), and the contact of the area of one of the pieces is made by the inwardly facing surface of the secondary, or outer nut, rather than by the inwardly facing surface of the primary, or inner nut, classification is not in this area (93+) but is in subclass 96 below, instead.
- (2) Note. In the case of an "undercut" nut, the inwardly facing surface frequently is the inwardly facing surface of the larger diameter portion, rather than the corresponding surface of the smaller diameter portion.

**94 Special fishplate engaging inwardly facing surface:**

This subclass is indented under subclass 93. Device wherein that one of the pieces which has an area contacted by the inwardly facing surface comprises a fishplate associated with a joint between two railroad rails, which fish-

plate has been modified as to become, itself, one of the coacting pieces.

- (1) Note. This subclass notes that a fishplate is treated as comprising only substructure, because the fishplate modifications found herein could not be ignored.
- (2) Note. On the other hand, "modified" is not intended to include such commonly occurring fishplate features as (a) a cavity extending longitudinally of the rail-facing side of the fishplate or (b) a notch or equivalent provision, located along a tie-confronting lower lip of a fishplate, for receiving a hold-down spike.
- (3) Note. The alteration to the fishplate occasionally is merely the provision therein of a tapped opening for receiving a bolt which retains another one of the pieces to the fishplate.

**95      Elastically or plastically deformable part:**  
This subclass is indented under subclass 93. Device wherein one of the pieces is resiliently or yieldably deformable, either in whole or in part, and is deformed during its coaction with the one or more other pieces.

**96      Having plural parts, one comprising a keeper:**  
This subclass is indented under subclass 92. Device wherein the member consists of two or more coacting pieces, at least one of which functions merely to prevent another piece, or pieces, from moving out of operative engagement with the bolts or nuts.

- (1) Note. While some of the art of this subclass strongly resembles that of subclass 94 above, a closer examination will reveal that the fishplates of this art (96) are not "special" within the meaning of that subclass (94) and therefore are treated as comprising only substructure; see (1) Note and (2) Note of subclass 94.
- (2) Note. The part which serves a holding function is, in some instances, no more than a spike for anchoring a disclosed rail assembly.

SEE OR SEARCH THIS CLASS, SUBCLASS:

93,      for the reference to this subclass (96) appearing in (1) Note thereof.

**97      Unitary member, deformable in whole or in part:**

This subclass is indented under subclass 92. Device wherein the member consists of a single piece of material which is, at least in part, elastically or plastically deformable in nature and which undergoes deformation for the purpose of being placed into, retained in, or removed from operative engagement with the bolts or nuts.

**98      And engaging the inwardly facing surface of the bolt heads or nuts:**

This subclass is indented under subclass 90. Device wherein the member includes, on its surface which is opposite to its substructure-facing surface, regions which engage against rotation, in at least one direction, the inwardly facing surfaces of two or more bolt heads or nuts.

- (1) Note. The engagement for restricting rotation may involve only frictional contact.
- (2) Note. The member may include a bendable portion (e.g., a tab) for deformation into engagement with a side of a bolt head or a nut subsequent to assembly of the bolt or nut with the member and the substructure.

**99      Including separable keeper for member:**  
This subclass is indented under subclass 90. Device provided with a second, other (i.e., an additional) element for preventing the member from moving away from that position in which it makes contact with the one or more planar, sidewardly facing regions of each of the bolts or nuts.

**100      Including element spacing member from substructure:**

This subclass is indented under subclass 90. Device provided with a second, other (i.e., an additional) element for locating the member a slight distance apart from the substructure.

- (1) Note. The additional element sometimes functions as a carrier for the member, or sometimes to allow relative movement of the member, or, at other times, for a purpose not related to either of these two.

**101 Locked by a piece abutting inwardly facing surfaces of a plurality of nuts or bolt heads:**

This subclass is indented under subclass 81. Device wherein the other element, or at least one of a plurality thereof, comprises a member formed either of a single piece of material or a plurality of pieces so related to one another as to function as a single piece, which piece or pieces are positioned in such a manner that one principal surface thereof occupies a plane which generally parallels an outwardly facing surface of the substructure and wherein the opposite principal surface of the piece or pieces contains regions which engage against rotation, in at least one direction, the inwardly facing surfaces of two or more bolt heads or nuts.

- (1) Note. The engagement for restricting rotation may involve only frictional contact.
- (2) Note. Occasionally, the regions of the member and the inwardly facing surfaces of the bolt heads or nuts are provided with formations which are complementary to one another, and, in some instances, the formations are of the kind which resist rotation to a greater degree in one direction of turning than in the other.
- (3) Note. In some instances, the member engages an element which underlies the inwardly facing surface of a bolt head or a nut and thus intervenes between the member and the surface.

**102 Locked by a piece connecting two consecutive fasteners:**

This subclass is indented under subclass 81. Device including two or more elements arranged successively along one or the other or both faces of a substructure, each element restricting one bolt or nut but being so associated with at least one other such element, either directly or by way of a bolt, nut or substructure,

as to restrict two or more successively arranged bolts or nuts.

- (1) Note. Frequently, the number of elements in the series thereof equals the number of bolts or nuts in the series thereof.

- (2) Note. The art of this subclass is neither clearly plural within the sense of subclasses 84 to 101 above, nor strictly singular within the meaning of subclasses 103 to 165 below.

**103 Multipart nut assembly with one member attached to structure or substructure:**

This subclass is indented under subclass 81. Device wherein the other element, or at least one of a plurality thereof, comprises a member which is connected to, or otherwise held in contact with, the substructure adjacent to, at or within either a hole which penetrates the substructure or a pocket which enters the substructure to an extent less than its thickness and which member functions to locate and support a single bolt or nut in such a manner, relative to the substructure, that the longitudinal axis of the bolt or the nut is in alignment with the principal axis of the hole or pocket, the purpose of the arrangement being to place the bolt or nut in a proper position for receiving the nut or bolt, respectively, which is intended to be placed in threaded engagement with it.

- (1) Note. In a few instances, the member is an assembly of plural elements functioning as one.
- (2) Note. In locating and supporting the bolt or nut relative to the substructure, the member restricts, or assists in restricting, the bolt or nut against axial movement in addition to its usual function of restricting, or assisting in restricting, the bolt or nut against rotational movement.

**104 Through-passage or recess having laterally extending entry for inserting member and nut:**

This subclass is indented under subclass 103. Device wherein the substructure additionally includes a cross passage which enters the hole or pocket from a side thereof, which cross passage is for the purpose of moving the member,

and a nut held therein or thereon, into alignment with the axis of the hole or pocket, and, hence, into alignment with the bolt which will be placed into the hole or pocket.

- (1) Note. The "width" of the member-nut assembly is greater than the diameter of the hole or pocket, thus, necessitating the provision of a cross passage for inserting the assembly into bolt-receiving position.
- (2) Note. The member frequently holds the nut loosely in order to allow for limited realignment thereof when the bolt is introduced.
- (3) Note. The member-nut assembly hereof is often identified as a "barrel nut".

**105 And a second substructure and means for capturing a complementary nut or bolt thereto:**

This subclass is indented under subclass 103. Device provided with an additional substructure and with means for attaching thereto against separation, but not against rotational or limited longitudinal movement, a nut, or a bolt, which is intended to mate with the bolt, or the nut, held to the first substructure by the member.

- (1) Note. The second substructure may be in the nature of a panel.
- (2) Note. Included occasionally herein is means (e.g., a thread lock) for coupling a bolt to its complementary nut.

SEE OR SEARCH THIS CLASS, SUBCLASS:

167, for the search notes therein pertaining to thread locks.

**106 Having means for coupling a bolt to a nut:**

This subclass is indented under subclass 103. Device which includes means for restricting the turning of the bolt relative to the nut, or vice versa, which means may be the member or a portion thereof or may be the thread structures of the bolt or nut or the manner in which those structures interengage.

SEE OR SEARCH THIS CLASS, SUBCLASS:

167, for the search notes therein pertaining to thread locks.

**107 Member anchors bolt in substructure with threaded portion exposed (e.g., stud bolt):**

This subclass is indented under subclass 103. Device wherein the member holds one part of a bolt in the hole or pocket in such relation to the surface of the substructure that another part of the bolt, which is threaded, extends outwardly therefrom.

- (1) Note. The first-mentioned part of the bolt may be the head or a portion of the shank, threaded or unthreaded, while the last-mentioned part is the shank, or the remainder thereof, and is threaded.
- (2) Note. The bolt of this subclass is commonly referred to as a "stud bolt".

**108 Nut-encompassing sleeve member engaged within through-passage or recess:**

This subclass is indented under subclass 103. Device wherein the member is tubular in nature and has its external surface in contact with the sidewall of the hole or pocket, and wherein a nut is anchored to the substructure by being inserted into the hollow interior of the member and engaged therewith.

- (1) Note. In some instances, the exterior of the nut and the interior of the member are threaded, and the engagement of the one with the other is of a threaded nature.
- (2) Note. Occasionally, the external surface of the member is threaded, in which event the member may be turned into the substructure.

**109 Locking ring coaxially related to an elongated, externally threaded nut:**

This subclass is indented under subclass 103. Device wherein the member is a circular band or loop and has, as its axis, the longitudinal axis of a nut, and wherein the nut has a significant longitudinal dimension and is provided with an outer surface which is threaded for engaging the sidewall of the hole or pocket, the



circular band or loop supplementing the side-wall engagement in joining the nut to the substructure.

- (1) Note. The band or loop may encompass the nut or it may be outwardly of an end thereof.
- (2) Note. The sidewall of the hole or pocket may be plain or threaded.

**110 Member comprises a longitudinal key:**

This subclass is indented under subclass 103. Device wherein the member comprises one or more elongated elements which extend generally parallel to the longitudinal axis of the bolt or nut and which engage the substructure at the hole or pocket formed therein and also engage whichever of the bolt or nut is held in the hole or pocket.

- (1) Note. Most typically, the nut takes the form of an internally threaded sleeve which is recessed into the substructure, and the key is at least one bar or rod inserted at the juncture of the outer surface of the sleeve with the wall of the hole or pocket; if two or more keys are utilized, they are spaced apart there-around.

**111 Member includes elastically or plastically deformable portion:**

This subclass is indented under subclass 103. Device wherein the member includes one or more parts or regions which are movable, either resiliently or yieldably, to another position relative to the remainder of the member for either (a) supporting the bolt or nut in or on the member or (b) connecting the member to the substructure.

**112 Having elastically deformable portion for attaching member to substructure:**

This subclass is indented under subclass 111. Device wherein the movable part or region is either so configured, or formed from such a material, or both, that, when released from the moving force, it will tend to return to its former position (i.e., the part or region is resilient), which property is utilized for affixing the member to the substructure.

**113 Plastically deformable portion:**

This subclass is indented under subclass 111. Device wherein the movable part or region is formed from such a material that, when released from the moving force, it remains more or less in the position into which it was moved (i.e., the part or region is nonresilient).

- (1) Note. Typical of the art of this subclass is a member provided with two or more locating tabs, the tabs being bendable into a position in which they grip the edge of an aperture formed in a platelike substructure.

**114 Locked by pawl and toothed or tooth-like piece:**

This subclass is indented under subclass 81. Device wherein the other element comprises a member which engages the substructure in a rotation restricting manner and which has formed on or in it one or more holes, stepped surfaces, notches, etc., which holes, etc., receive, at least momentarily as the bolt or the nut is turned, a pivotal (either about a defined axis or merely bendable) dog, a reciprocable pin, etc., which is mounted on or in the bolt head or the nut (e.g., a spring loaded pin slidable in a cavity formed in the nut eccentrically to the threaded hole thereof).

- (1) Note. The movable pawl most frequently comprises a second, other (i.e., an additional) element.

SEE OR SEARCH THIS CLASS, SUBCLASS:

125, for the reference to this subclass (114) appearing in (2) Note thereof.

**115 Having discrete, reciprocably movable pawl:**

This subclass is indented under subclass 114. Device wherein the movable pawl is a second, other (i.e., an additional) element which is so mounted on or in the bolt head or nut that it may move back and forth relative thereto.

**116 Head or nut side face held by discrete member (e.g., side lock):**

This subclass is indented under subclass 81. Device wherein the other element, or at least one of the plurality thereof, comprises a mem-

ber which engages the substructure and which has at least one portion for contacting (a) either at least one planar, side surface of a plural-sided bolt head or nut or at least one formation (e.g., a corner formed by the junction of adjacent side surfaces, a tooth, etc.) on the side of a bolt head or nut or (b) a corresponding flat side or sidewardly facing formation on a second, other (i.e., an additional) element which is located on the axis of, and is caused to turn with, the bolt head or nut, which additional element substitutes for the bolt head or nut insofar as engagement with the member is concerned.

- (1) Note. The coaction of the member with the substructure is an essential aspect of the member's capability for restricting rotation of the bolt or nut relative to the substructure.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

90+, for another body of art of this area (83+) which is directed to a "side lock", but wherein a plurality of bolts or nuts is involved.

#### 117 **Adjunct carried flat or formation:**

This subclass is indented under subclass 116. Device provided with a second, other (i.e., an additional) element, which has the one or more sidewardly facing surfaces or formations and is located on the axis of, and turns with, the bolt head or nut, and wherein those surfaces or formations, rather than the sidewardly facing surfaces or formations of the bolt head or nut, are engaged by the member.

- (1) Note. If the flats or formations are located on an extension of the member, rather than on a separate element which is coaxial with the member, classification is not here in subclass (117) but is elsewhere in this area (116+).
- (2) Note. Frequently, the sidewardly facing formations of the additional element comprise a plurality of teeth in the nature of a ratchet.

#### 118 **And thread lock coupling complementary fasteners:**

This subclass is indented under subclass 116. Device wherein the bolt and the nut which is threadedly engaged therewith are prevented from turning relative to one another by a locking action which results from either (a) the character of (1) the thread of one or both or (2) the interengagement of the thread of one with the thread of the other, or (b) the presence, in the threaded region, of another element which is neither the one other element, nor is it the additional element of subclass 116 above.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

167, for the search notes therein pertaining to thread locks.

#### 119 **Member having opening or notch engaging a bolt head or nut on two sides:**

This subclass is indented under subclass 116. Device wherein that portion of the member which engages the one or more sides or formations of the bolt head or nut is the radially inwardly facing edge or wall of a passage through the member, the passage being located either (a) entirely within the boundaries of the member or (b) along a boundary thereof and thus having a periphery which is not a closed figure, the engagement, in either case, involving at least two of the sides or formations of the bolt head or nut.

- (1) Note. In the instance of a hexagonal bolt head or nut, the engagement of the member therewith usually involves at least three of the sides or formations.

#### 120 **And element maintaining member in operative engagement with bolt head or nut:**

This subclass is indented under subclass 119. Device provided with a second, other (i.e., an additional) element, which additional element either connects the member to the substructure or to the bolt head or nut or otherwise functions to retain the member in rotation restricting engagement with the bolt head or nut.

**121 Member elastically or plastically deformable for attaching it to bolt head or nut:**

This subclass is indented under subclass 119. Device wherein the member, or a part thereof, is resiliently or yieldably deformable for enabling the member to grip or otherwise hold itself in contact with the bolt head or nut.

**122 Member having portion (e.g., tab) deformable in situ into engagement with flat or formation:**

This subclass is indented under subclass 116. Device wherein that portion, or one or more of a plurality thereof, of the member which engages the one or more sides or formations of the bolt head or nut is a plastically deformable part of the member, which part is bent or otherwise deformed into contact with the side or formation after the member and the bolt head or the nut have been united with the substructure.

**123 And having specific structure to coact with substructure:**

This subclass is indented under subclass 122. Device wherein the member also has, on or proximate to its region which confronts the substructure, means for engaging the substructure in such a manner that any tendency of the member to turn relative to the substructure is either eliminated or minimized.

- (1) Note. The means may be in the nature of pointed or otherwise sharpened projections which will tend to dig into the member-confronting surface of the substructure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

134+, for a member located at least in part between the substructure and the inwardly facing surface of the bolt head or nut, and wherein means is provided for retaining, prior to assembling two or more of the bolt, nut and substructure with one another, the member to one of those three components in approximately the position it will occupy subsequent to the assembly, and further wherein the means may comprise prongs or tabs on the member which extend more or less

normally thereto and grasp the sides of the bolt head or nut.

**124 Projection on member and coacting formation in substructure:**

This subclass is indented under subclass 123. Device wherein the means on the member is in the form of one or more teeth, ridges or the like, which form axial extensions of the member, and wherein the substructure has one or more recesses, grooves or the like for either receiving the teeth, etc., or otherwise cooperating with them to restrict rotation of the member relative to the substructure.

**125 Sheet metal member having resilient pawl distorted therefrom:**

This subclass is indented under subclass 116. Device wherein that portion, or one or more of a plurality thereof, of the member which engages one or more of the flat sides or sidewardly facing formations of the bolt head or nut is a pawl which is elastic in nature and is formed by bending, cutting, punching, stamping, etc., a part of a sheet metal member away from the plane of the remainder of the member.

- (1) Note. Most typically, the nonplanar part is depressed and overridden by the corners of a bolt head or nut while the latter is turning in its tightening direction, subsequent to which the part springs back into a position whereby it blocks the path of a side of the bolt head or nut.
- (2) Note. In several respects, the art of this subclass presents a reversal of parts in contrast with the art of subclasses 114+ above, the latter art having the pawl carried by the bolt head or the nut.

SEE OR SEARCH THIS CLASS, SUBCLASS:

114+, as explained in (2) Note above.

**126 Member includes means which attempt to penetrate substructure:**

This subclass is indented under subclass 125. Device wherein the sheet metal member includes, on its substructure-confronting region, means (e.g., one or more pointed protrusions, sharp edges, etc.) for digging into, or attempting to dig into, the surface of the substructure in order to either eliminate or else

minimize turning of the member relative to the substructure.

**127 Member abuts coaxing part on substructure:**

This subclass is indented under subclass 125. Device wherein the sheet metal member, or a part thereof, moves into engagement with, and is blocked by a particular region (e.g., an edge, a flange) of, or a specific formation (e.g., a lug) on, the substructure, in order to either eliminate or else minimize turning of the member relative to the substructure.

**128 Member, or portion thereof, comprises movable pawl:**

This subclass is indented under subclass 116. Device wherein either the member, or one portion of a member which has a plurality of portions, comprises a dog, lug, pin, etc., for blocking the turning of the bolt head or the nut in one direction by engaging one or more flat sides or sidewardly facing formations thereof, but which is pivotable, slidable, deflectable or otherwise repositionable by the bolt head or the nut to avoid blocking a turning movement in the opposite direction on the part of either of them.

(1) Note. (2) Note of subclass 125 above is applicable here, also.

SEE OR SEARCH THIS CLASS, SUBCLASS:

114+, as explained in the Note referred to in (1) Note above.

**129 Member engages inwardly facing surface of bolt head or nut:**

This subclass is indented under subclass 116. Device wherein the contact of a region on the outwardly facing surface of the member with all or part of the inwardly facing surface of the bolt head or nut is relied upon to contribute to the rotation restricting function of the one or more portions of the member.

**130 And is formed from plural, cooperating parts:**

This subclass is indented under subclass 129. Device wherein the member consists of at least two parts which are discrete but which work with one another to perform the function of the member.

**131 And has specific structure to coax with substructure:**

This subclass is indented under subclass 129. Device wherein the member has means (e.g., a flange, one or more linear segments on its perimeter, a projection, etc.) for engaging the substructure, or a particular part (e.g., an edge, a flange) thereof, or a formation (e.g., a groove, a recess) thereon, in such a manner that any tendency of the member to turn relative to the substructure is either eliminated or reduced.

**132 Lock washer type member located between substructure and bolt head or nut:**

This subclass is indented under subclass 81. Device wherein the other element, or at least one of a plurality thereof, comprises a member which, or a part of which, lies between the substructure and that surface of the bolt head or nut which faces in the direction of the substructure for the purpose of resisting rotation of the bolt head or nut relative to the substructure.

(1) Note. While the coupling, by the member, of the bolt head or the nut to the substructure obviously requires the mutual locking together of all three, the art of this and the indented subclasses is sometimes concerned only with the cooperative relationship of the bolt head or nut to the member or of the member to the substructure. In such instances, it becomes necessary to assume that a suitable coupling exists at the other interface.

(2) Note. The location of the member between the bolt head or nut and the substructure does not necessarily require that the member have two, oppositely facing, regions of contact but such is frequently the case (e.g., the member may be a washer).

(3) Note. "Located between", in its broadest sense, has been construed to include the instance in which a member merely passes through, or only protrudes into, the region in which the substructure and the inwardly facing surface confront one another. Indented subclass 140, for example, is predicated upon such a construction of that phrase; in addition,

other art involving a somewhat similar, elongated element type of member, but wherein (a) the member may protrude from either the substructure or the inwardly facing surface of the bolt head or the nut, and (b) there is no significant entry of the member into the inwardly facing surface or the substructure, respectively, is found in this subclass (132).

- (4) Note. The structure discussed in (3) Note above sometimes is in the nature of a set screw. On the other hand, subclass 83 above also contains a body of set screw art, which art is distinguishable from the set screws of this area (132+) on the following basis: The set screw art of subclass 83 does not involve a traversing of, nor even an entry into, by the set screw, of the region in which the substructure and the inwardly facing surface confront one another.

**133 Member fixed to bolt shank, and member or bolt fixed to substructure:**

This subclass is indented under subclass 132. Device wherein one or both of the member and the bolt are either limited in, or fixed against, turning relative to the substructure, and wherein means is provided, at least on the member, but, more commonly, on both the member and the shank of the bolt, whereby the two engage each other in such a manner that the turning of one relative to the other, at least in one direction, is either eliminated or severely limited.

- (1) Note. The member is sometimes a composite of two or more coacting elements, one of which elements engages the substructure and the other of which engages the shank of the bolt.
- (2) Note. The limiting or fixing of the member may involve, for example, substructure-penetrating formations on the member, while the limiting or fixing of the bolt may be predicated upon, for example, the squaring of a portion of the shank for engaging an opening complementary thereto in the substructure.

- (3) Note. The means on the shank of the bolt may comprise structure in the nature of a flat, a keyway, a thread, etc.

**134 Means holding member to bolt, nut or substructure prior to use:**

This subclass is indented under subclass 132. Device which includes means for retaining the member to the bolt or the nut or the substructure in approximately the position it will occupy subsequent to the assembly of at least two of those three components with one another.

- (1) Note. Preassembly represents an effort to insure that the member (e.g., a washer) will be in the right place (e.g., on a bolt) at the right time.
- (2) Note. Preassembly with a bolt frequently is accomplished by forming, or completing the formation of (e.g., bringing the thread's crest to its full diameter), the bolt's thread after the member has been associated with (e.g., placed upon the shank, adjacent the head of) the bolt.
- (3) Note. While the member of this subclass is, in most instances, free to rotate relative to the bolt, nut or substructure with which it has been preassembled until such time as that bolt, nut or substructure is tightened against some other one of the components, occasionally it is found that the type of structural engagement involved in the preassembly is of a nature which precludes relative rotation.
- (4) Note. It is sometimes found in the art of this subclass, especially in the instance of the preassembly, with a bolt, of a member which has variations in its axial dimension, such as a lock washer with twisted teeth, that the bolt is so proportioned or structured that the maximum extent to which it can be tightened during assembly is somewhat less than the extent at which it would flatten the washer's teeth into the plane of the remainder of the washer, thus, avoiding the loss of locking efficiency on the part of the teeth.

**135 By discrete element:**

This subclass is indented under subclass 134. Device wherein the means for holding the member to the bolt, nut or substructure comprises a second, other (i.e., an additional) element.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

137, for a plural element member which may resemble somewhat the member and additional element of this subclass (135), but see the reference to this subclass appearing there (137) for an explanation of the fundamental difference.

**136 Member comprises looplike element (e.g., washer) interlocked with additional element, one of them engaging substructure or surface in other than planar, face to face contact:**

This subclass is indented under subclass 132. Device wherein the member is made up of two or more elements which are so structured as to mechanically interengage, interconnect, interlock, etc., in a manner which limits, in at least one direction, the movement of one element with respect to at least one other element, and wherein one or more of the elements form a closed, or a more nearly closed than open, circle or polygon, the central axis of which is in, or approximately in, coincidence with the principal axis of the bolt or nut, and further wherein one or more of the elements makes contact with the substructure or with the inwardly facing surface of the bolt head or nut in a manner which involves more than that represented by engaging one flat face with another such face.

- (1) Note. In this subclass (136), that element of the member which is in confronting relation with the inwardly facing surface frequently is provided with, on its surface-confronting portion, teeth or equivalent formations for increasing the resistance to turning, at least in an unthreading direction, of the bolt or nut.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

146, for the reference to this subclass (136) appearing in (2) Note thereof.

**137 Two looplike elements interlocked by laterally introduced key:**

This subclass is indented under subclass 136. Device wherein the member is made up of two elements which form a closed, or a more closed than open, circle or polygon, and another element which is inserted between the two elements by movement toward, and more or less at right angles to, the axis of the bolt, the insertion of the other element serving to key the two elements against rotation relative to one another.

- (1) Note. The usual practice in the art of this subclass is to place the two elements on a bolt and then turn a nut tightly into place on the bolt. The key is then inserted at the juncture of the two elements. Having eliminated any possibility of rotation of one of the two elements relative to the other, it is not expected that the nut will tend to turn in an unthreading direction. To further insure the absence of any such tendency, the substructure-confronting element of the member often includes structure to restrict it in rotation relative to the substructure, and the element confronting the inwardly facing surface of the nut sometimes is provided with teeth or equivalent formations for enhancing its engagement with the nut.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

135, for another device of this area (132+) which occasionally utilizes two, more or less annular, elements; in that subclass, however, one of those elements constitutes the member, whereas the other element serves to retain the one element (i.e., the member) in place.

**138 Pawl element, movably carried by looplike element, coacts with ratchet on surface:**

This subclass is indented under subclass 136. Device wherein the looplike element, or one of a plurality thereof, mounts, supports or other-

wise holds another element which includes a portion for engaging the inwardly facing surface of the bolt head or nut, which portion is capable of some degree of movement relative to the surface, and wherein the surface has at least one, and usually a plurality of, steps or related formations, which formations constitute a ratchet, whereby the movable portion of the other element serves as a pawl for engaging the ratchet and restricting the rotation, in at least one direction, of the bolt or nut.

**139 Laterally introduced key locks looplike element to surface:**

This subclass is indented under subclass 136. Device wherein an element of the member is a pin, rod, wedge, etc., which is inserted between, by movement toward and more or less at right angles to the axis of the bolt, the confronting regions of the looplike element and the inwardly facing surface of the bolt head or nut, the element penetrating, at least to some extent, each confronting region and serving to key the looplike element and the bolt head, or the nut, to one another.

- (1) Note. Frequently, both confronting regions are provided with a groove, recess, etc., for receiving the element; in the event, however, that only one region has such a groove, etc., then it is customary to utilize the element to cut (e.g., by providing it with a sharpened edge) or otherwise form a channel, notch, etc., for its reception in the other region.

**140 Elongate member moves in longitudinally extending opening in bolt head or nut to enter substructure:**

This subclass is indented under subclass 132. Device wherein the member is a nail, pin, screw, or other element having length as its principal dimension, which element is contained by or passes through a recess, or an aperture, respectively, in, and extending more or less parallel to the principal axis of, the bolt head or nut, and further wherein the element is intended to be moved along its longitudinal axis to an extent where a portion of it enters the substructure while another portion remains in engagement with the bolt head or nut, and additionally wherein entry of the element into the substructure is by way of either (a) utilizing a recess provided therein for receiving it, or (b)

having sufficient force applied to it to cause it to penetrate the surface of the substructure.

- (1) Note. Exemplary of the element of (a) of the definition is a spring-loaded plunger, while the element found most commonly in (b) is either a pointed, machine screw which is carried by an off-center, threaded bore in the bolt head or nut, or a threadless fastener which is impact driven into the substructure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 132, in regard to the reference to this subclass (140) which appears in (3) Note thereof.

**141 Locking dog or pawl carried by bolt head or nut and engaging substructure:**

This subclass is indented under subclass 132. Device wherein the member is, in whole or in part, a tonguelike element which is accommodated in, attached to or otherwise held by the bolt head or nut and which is pivotably, yieldably, or otherwise movable, upon commencement of unthreading rotation of the bolt or nut, into a position in which it engages the substructure in such a manner as to either block or at least severely restrict movement in that direction.

- (1) Note. The tonguelike element assumes a substructure-penetrating attitude when called upon to block movement.
- (2) Note. While engagement of the tongue-like element with the substructure takes place somewhat prior to reaching the tightened position of the bolt head or nut, it does not, generally, offer significant resistance to rotation in the tightening direction.
- (3) Note. In some instances, a single bolt head or nut may be provided with more than one tonguelike element.

**142 Key introduced laterally at juncture of surface and substructure:**

This subclass is indented under subclass 132. Device wherein the member is in the form of a pin, rod, wedge, etc., and is inserted between, by movement toward and more or less at right

angles to the axis of the bolt, the inwardly facing surface of the bolt head or nut and that portion of the substructure which confronts the surface, and further wherein a portion of the pin, etc., lies within the surface and another portion thereof lies within the substructure, thereby serving to key the bolt head, or the nut, to the substructure.

- (1) Note. Most commonly, both the surface and the substructure include a provision (e.g., a groove) for receiving their respective portions of the pin, etc.; in some instances, however, at least one of them lacks such a provision, in which event the pin, etc., may be provided with a sharpened, longitudinally extending ridge (e.g., an edge) for forming a channel, notch, etc., as it is being moved into place.

**143 Formations on either member or surface, and cooperative, restricting means on the other:**

This subclass is indented under subclass 132. Device wherein either the member or the inwardly facing surface of the bolt head or nut includes at least one formation (e.g., a groove, ridge, spur, etc.), and the other is provided with means for coactingly engaging the formation or formations, the engagement serving to prevent or limit rotation of the member and the surface relative to one another.

- (1) Note. The engagement may be selective in nature.
- (2) Note. A mere corner, edge, etc., of the member or the surface does not constitute a "formation" within the meaning of this subclass; a concavo-convex relationship, however, is considered to be proper for inclusion here.

**144 Formations on surface, means on member, one of which presents a sharp edged configuration:**

This subclass is indented under subclass 143. Device wherein the one or more formations are located on the inwardly facing surface of the bolt head or the nut and the means is located on the member, and either the formations or the means, or both of them, has a sectional configuration which includes points or lines, which

points or lines are formed by the angular intersection (usually at 90° or less) of regions of the surface or the member (e.g., a chisel edge, cone, corner, parallel-walled channel, rectangular tooth, ridge, V-groove, etc.).

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 143, for related structure, but wherein none of the engagement is of, for example, the chisel-edge-to-V-groove type; in other words, the formations and structures of that subclass 143 tend to be rounded or otherwise gently undulating in cross section.

**145 Formations comprise ramplike teeth, means comprises a movable pawl:**

This subclass is indented under subclass 144. Device wherein the formations on the inwardly facing surfaces of the bolt head or the nut are in the nature of successive teeth, each having a configuration consisting of an incline, followed by a decline, the latter usually being a sharp (e.g., a straight) drop, and wherein the means on the member, which means is movable in response to a force applied thereto in a particular direction by a moving tooth, may comprise (a) a protruding portion of the member, which portion either is in itself resilient or else is resilient by virtue of the nature (e.g., the material) of the member, or (b) an attachment to the member which is movable (e.g., pivotally) relative to the member.

- (1) Note. Exemplary of (a) above is a split washer having one of its free ends positioned to engage the teeth, which free end frequently is distorted or otherwise reshaped into a lip-like configuration.

**146 And substructure accommodation for member portion:**

This subclass is indented under subclass 145. Device wherein the member includes structure (e.g., a surface protuberance, an arm, etc.) for entering or otherwise engaging with a cavity, slot, etc., provided in the substructure for receiving it, and which cavity, etc., is located, at least in part, below the surface of the substructure.

- (1) Note. In perhaps its most simplistic manifestation, this subclass adds, to the



split washer example of (1) Note of subclass 145 above, a shoulder, inset into the substructure, for backing up the other free end of the washer.

- (2) Note. As an alternative to forming the cavity, etc., in the substructure, a separate plate, attached to the substructure, may be utilized for providing such a feature; however, patents disclosing and claiming such an alternative structure usually meet the limitations of subclass 136 above and so will be found there.
- (3) Note. It is occasionally disclosed in the art of this subclass that, if the substructure is of wood rather than metal, the requirement for a cavity, etc., in the substructure may be dispensed with and the protuberance, etc., merely be forced into the substructure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

136, as explained in the reference thereto appearing in (2) Note above.

#### **147 Member comprises washer formed as closed loop or apertured plate or as split ring:**

This subclass is indented under subclass 132. Device wherein the member consists of at least one element in the form of an open-center figure having a principal axis which generally coincides with the longitudinal axis of the bolt or the nut and wherein the figure may either (a) form a closed path as in (1) a ring or (2) a disc-like element having an opening more or less in its center and having axially facing regions of significantly greater area than in the instance of (1); or (b) form other than a closed path by having free ends which (1) fall short of meeting one another or (2) pass one another and extend therebeyond.

- (1) Note. In the absence of a locus elsewhere (i.e., in an area not involving a substructure relationship) for the member, per se, patents claiming only the member, as well as patents claiming the member in combination with the bolt, nut or substructure, are included in this and the indented subclasses.

- (2) Note. A member having some degree of compressibility, but which compressibility is achieved in a manner not provided for elsewhere in this area (147+), will be found in this subclass (147).
- (3) Note. Included herein is a collection of art wherein the outer periphery of the member is given some particular configuration (e.g., rectangular, square, etc.), which configuration ordinarily might not be deemed to be particularly relevant to the member's description as "an open-center figure forming a closed or a non-closed path".
- (4) Note. Also collected herein is a small amount of art disclosing a washer-to-bolt-thread relationship.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 151, for the reference to this subclass (147) appearing in (1) Note thereof.
- 170, for a nut and an apertured spacer therefor which are formed adjacent to one another in a strip of material and are then placed in axial alignment with one another by folding the strip about an axis located between the nut and the spacer portions thereof; while the spacer remains attached to the nut and therefore does not qualify as an additional element for this subclass (147) and the indented subclasses, it sometimes functions in a manner related thereto.
- 531+, for washer structure when the washer is not a part of a rotation restricting arrangement for a bolt or nut.

#### **148 Engaging side wall of counterbore in substructure:**

This subclass is indented under subclass 147. Device wherein the substructure is provided with either a cylindrical or a conical enlargement of a portion of the bolt shank passage, which enlargement receives either a bolt head or a nut, and wherein the open-center figure, or one of a plurality thereof, makes contact with some portion of the inner surface of the enlargement.

- (1) Note. Frequently, the open-center figure is configured to embrace a bolt head which is formed with an upwardly and outwardly flared (e.g., a beveled), substructure-confronting surface.
- 149 Plural, axially adjacent washers, or plural part washer:**  
This subclass is indented under subclass 147. Device wherein there are either (a) two or more open-center figures located next to one another along the axis of the bolt or nut, or (b) a single open-center figure which is made up of two or more different components, parts, substances, etc.
- (1) Note. Included herein is a device of the kind wherein an open-center figure is formed in each of the two ends of a strip of material and the strip then folded about the mid portion of its length to place the figures in axial alignment.
- (2) Note. In the instance of the single, composite figure, the several components, parts, substances, etc., usually are readily discernible as such, even though they may be rather intimately associated with one another.
- 150 Having one washer, or washer part, of a more yieldable nature than another washer, or part:**  
This subclass is indented under subclass 149. Device wherein either one of the two or more open-center figures, or one of the two or more different components, parts, substances, etc., of a single such figure, is, by composition or configuration, more bendable, compressible, etc., than another of the figures or another of the components, etc., of the single figure.
- 151 Split ring having radially outwardly extending end:**  
This subclass is indented under subclass 147. Device wherein the open-center figure does not form a closed path, but, instead, has two, distinct ends, and further wherein one or both of the ends turn from the remainder of the figure in a direction away from its principal axis.
- (1) Note. Those loops which have free ends but which fail to meet the requirements of either this subclass (151) or subclasses 152+ below are classified elsewhere in this area on some other basis, if applicable, or, if not, then in subclass 147 above.
- 152 Ends of split ring overlap in stressed condition:**  
This subclass is indented under subclass 147. Device wherein the open-center figure does not form a closed path, but, instead, has two, distinct ends, and further wherein those ends pass beyond one another to the extent that, when the figure is subjected to an axially directed load as the result of the tightening of the bolt or nut, they will be superposed relative to one another in a direction paralleling the principal axis of the figure.
- (1) Note. The "stressed condition" limitation is intended to rule out those open-center figures wherein, in a relaxed state, the ends appear to overlap, but which ends, upon the compressing of the figure by the tightening of the bolt or nut, move apart to the extent that there is no longer any overlap.
- (2) Note. An overlap in a radial sense, that is, where the ends pass beyond one another but one lies farther from the principal axis of the figure than the other, is not the type of overlap contemplated by this subclass.
- (3) Note. (1) Note of subclass 151 above is applicable here, also.
- 153 Overlap of at least 180 degrees (e.g., coil):**  
This subclass is indented under subclass 152. Device wherein the distinct ends of the figure, having passed beyond one another, continue along paths in which they are axially superposed until they have traversed a total path or about 540° or more.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
147, for an open-center figure in the nature of a spiral, or a volute, spring.

**154 Apertured plate of uniform thickness having undulating contact surfaces:**

This subclass is indented under subclass 147. Device wherein the open-center figure is in the nature of a plate penetrated by a hole, and further wherein the plate shows, in a section paralleling its outer periphery and taken before the figure has been subjected to the pressure generated by the tightening of the bolt or nut involved, a series of wavelike formations.

- (1) Note. The "prior to being stressed" limitation excludes those figures which have circumferentially spaced projections on each of their axially directed, oppositely facing regions, which projections, if formed alternately on the two regions, may cause the outer periphery to take on an undulating configuration upon the application of an axial force to the figure.

**155 Apertured plate having arched sectional configuration (e.g., concavo-convex):**

This subclass is indented under subclass 147. Device wherein the open-center figure is in the nature of a plate penetrated by a hole, the center of the hole ordinarily representing a point on the principal axis of the figure, and further wherein the plate is curved in cross section in at least one direction or is otherwise so configured in section as to place its central portion in a different plane than some or all of its periphery, in order that it may bend to resist a force applied more or less axially.

**156 Arched configuration circumscribes aperture:**

This subclass is indented under subclass 155. Device wherein the figure is annular in nature, and further wherein the sectional curvature is displayed twice by a section which contains the principal axis of the figure (i.e., the material on one side of the central opening presents, in section, a mirror image of the material on the other side of the opening).

**157 Split ring having opposed ends offset axially:**

This subclass is indented under subclass 147. Device wherein the open-center figure does not form a closed (i.e., a noninterrupted) path, but, instead, has two, distinct ends, which ends,

although facing more or less toward one another, are misaligned from one another in a direction paralleling the principal axis of the figure at such time as the figure is not subjected to the axially directed loading imposed by the tightening of the bolt or nut.

- (1) Note. The misalignment results most frequently from the fact that the ends are not directed exactly toward each other; another example, however, is that of ends which are so formed as to have a surface area which exceeds the area of a section of the material and wherein, when forced into abutting contact, the end surfaces engage as to only a portion of their respective areas.
- (2) Note. The open-center figure of this subclass most commonly takes the form of a helix of slightly less than one full turn.
- (3) Note. The provision of means (e.g., the spacing of the ends, the configuration of the ends, etc.) for preventing the tendency, when handled in bulk, of two or more of the open-center figures to interlink with one another appears frequently in the art of this subclass.
- (4) Note. The open-center figure of this subclass is occasionally provided with a guard for confining the residue in the event of breakage of the figure.
- (5) Note. The open-center figure of this subclass is sometimes fabricated from twisted, rectangular or square, bar stock, thus providing the surface of the figure with upstanding ribs which wind about it throughout its circumference.

**158 Contact surface contains a plurality of generally radially extending ridges or grooves removed from the ends:**

This subclass is indented under subclass 157. Device wherein the open-center figure is formed with two or more projections or recesses facing the bolt or nut or facing the substructure, or with at least one projection or recess facing the bolt or nut and at least one other projection or recess facing the substructure, and further wherein the projections or

recesses have a length dimension whereby they traverse, in a direction generally paralleling that of a radian of the figure, that surface of the figure which faces the bolt or nut or that surface thereof which faces the substructure or both such surfaces, and additionally wherein the plurality of projections or recesses is in addition to any such projections or recesses as may be present at a location proximate to either of the free ends of the figure.

- (1) Note. The limitation which excludes projections or recesses at or immediately adjacent the free ends is necessitated by such extremely common practices as, for example, imparting a chisel-like shape to an end, bending an end slightly in an axial direction and thus forming a ridge at the axis of the bend, and so forth.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 157, for an open-center figure proper for this area (157+) having projections in the nature of spirally wound ribs, as explained in (5) Note of that subclass.

**159 Cross section other than rectangular:**

This subclass is indented under subclass 157. Device wherein the material from which the figure is fabricated displays, in section, something other than a four-sided polygon having  $90^\circ$  corners.

**160 Closed loop having plural variations in the profile of a contact surface or a peripheral edge thereof:**

This subclass is indented under subclass 147. Device wherein the open-center figure is a closed one of a more or less circular nature and has regions (e.g., contact surfaces) which face generally oppositely and which have a radial extent determined by the inner periphery and the outer periphery of the figure, and wherein at least one region, or at least one periphery, is formed with a pattern of recurring changes in the figure's dimension in an axial direction (i.e., its effective thickness).

**161 Variations comprise generally radially extending ridges or grooves:**

This subclass is indented under subclass 160. Device wherein the pattern of recurring changes in the figure's dimension in an axial

direction is formed by a plurality of projections or recesses which traverse one or both regions from adjacent one periphery of such a region to adjacent the other periphery and, more often than not, along the shortest path (i.e., a radian) therebetween.

- (1) Note. Included herein also, for example, are projections or ridges which (a) are slightly askew to a radian or (b) describe a somewhat curved path between the peripheries.

**162 Variations comprise circumferentially spaced projections or recesses inset from both peripheries:**

This subclass is indented under subclass 160. Device wherein the pattern of recurring changes in the figure's dimension in an axial direction is formed by a plurality of raised or depressed portions within one or both of the regions, which portions are spaced inwardly from the figure's outer periphery and outwardly from its inner periphery and are spaced from one another along an annular path.

- (1) Note. In the instance of a figure formed (e.g., stamped) from thin material, the structure which comprises a raised portion within one region usually comprises a depressed portion within the other region.

**163 Variations are teeth located along a periphery:**

This subclass is indented under subclass 160. Device wherein the pattern of recurring changes in the figure's dimension in an axial direction is formed by a plurality of toothlike projections positioned at, in or on one or both of the peripheries of the figure.

- (1) Note. The teeth frequently owe the bulk of their axial dimension to being turned or twisted, each about its base.

**164 Both peripheries:**

This subclass is indented under subclass 163. Device wherein the tooth like projections are at, in or on both the inner periphery and the outer periphery of the figure.

**165 Each twisted about its radial axis:**

This subclass is indented under subclass 163. Device wherein the toothlike projections either are located along the outer periphery of the figure and extend radially away therefrom or are located along the inner periphery and extend toward the figure's longitudinal axis therefrom, and, in either instance, the toothlike projections each follow generally the path of a radian and are each given a twist about the axis of such a radian.

**166 Design of fastener or substructure restricts rotation:**

This subclass is indented under subclass 81. Device wherein the means for either preventing or limiting turning of a specific bolt or nut relative to its substructure resides in one or more structural characteristics (e.g., configuration, composition, etc.) of one or another of the bolt, or the nut, or the substructure.

- (1) Note. If the structural characteristic of at least one of the cooperating members (bolt, nut or substructure) is something more than a flat (i.e., a bearing) surface, classification is here; however, if both of any two cooperating members afford no more than surfaces of a planar nature, and those surfaces are parallel to one other, classification is elsewhere (e.g., below, as an externally, or internally, threaded fastener, per se.)

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 81, for a collection of art wherein the means for preventing or limiting turning resides in a structural characteristic of a bolt, nut or substructure, as is provided for in this area (166+), but wherein a plurality of bolts and nuts are involved.
- 83+, for a threaded bolt or nut and means for restricting the rotation of one or both relative to a coacting substructure and wherein the means comprises at least one element which is in addition to the bolt, nut, or substructure and also is (a) movable relative to the bolt, nut or substructure or (b) separable therefrom or (c) connected without distortion thereto.

- 190+, for a threaded bolt and nut and means for coupling them against relative rotation. It is appropriate to observe here that, while the instances of coupling (a) a bolt and a nut to a substructure, or (b) a nut to a substructure, clearly are provided for in this area (166+) and would not get to that area (190+), the instance of coupling (c) a bolt to a substructure sometimes presents a less straightforward proposition, because the "substructure" may have some attributes of a static structure (for 166+), but may also, in other respects, appear to act very much in the nature of a nut (for 190+); accordingly, when a situation of that kind arises, consideration should be given to placing copies of the patent in both areas (166+ and 190+).

**167 Lock nut type on fastener:**

This subclass is indented under subclass 166. Device wherein there is also provided, on one or the other, or both, of the bolt or nut, thread structure of a kind which serves to couple one to the other to restrict rotation therebetween.

- (1) Note. The thread lock of this subclass ordinarily is separate from and not directly related to the means by which the bolt or nut is restricted in rotation relative to the substructure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 105, for the reference to a thread lock appearing in (2) Note thereof.
- 106, for a threaded fastener (i.e., a bolt or nut) and means for restricting the rotation thereof relative to a coacting substructure and wherein the means includes a restricting member and further wherein the member is preassembled with the substructure at a through-passage or a recess therein for holding a bolt or nut in coaxial relation with the through-passage or recess and additionally wherein means (e.g., a thread lock) is provided for coupling the bolt and the nut to one another.
- 118, for a threaded fastener (i.e., a bolt or nut) and means for restricting the rota-

tion thereof relative to a coacting substructure and wherein the means includes a restricting member and further wherein the bolt or nut, or a coaxial adjunct therefor, has a sidewardly facing flat or formation engaged by a portion of the member (e.g., a side lock) and additionally wherein a thread lock is provided for coupling the bolt (or nut) to a complementary nut (or bolt).

- 168, for a device of this area (166+), but wherein the means includes or consists of a thread lock between a bolt and a substructure, the latter functioning as a nut insofar as the bolt is concerned.
- 259+, for a threaded bolt and nut and means for coupling them against relative rotation and wherein the means is proximate to and involves the region of their threaded interengagement (i.e., a thread lock).

#### **168 Including a lock thread:**

This subclass is indented under subclass 166. Device wherein the rotation restricting means either includes as a portion thereof, or else consists wholly of, thread structure, on one or the other or both of the bolt and the substructure with which it is in threaded engagement, of a kind which serves to couple one to the other.

- (1) Note. The substructure functions here as a nut insofar as the bolt is concerned.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 105, 106, 118, and 259+, each as explained in the reference thereto appearing in subclass 167 above.
- 167, for a device of this area (166+), but wherein, in addition to the means for restricting the rotation of the bolt or nut relative to a substructure, there is also provided a thread lock for coupling the bolt to its nut.

#### **169 Mass of bolt head or nut offset from fastener longitudinal axis:**

This subclass is indented under subclass 166. Device wherein the mass of either the head of the bolt or of the nut is not centered on the longitudinal axis thereof, whereby, when that axis

is horizontal or significantly so, there will be a tendency for the bolt or nut, if properly oriented, to both oppose turning in an unthreading direction and encourage turning in the opposite direction.

#### **170 Nut and washer type formed from single blank folded over substructure:**

This subclass is indented under subclass 166. Device wherein the nut and structure (e.g., a washer) which will be axially aligned therewith and positioned between the nut and the substructure, but which remains integral with the nut, are formed in a more or less planar length of stock material and folded one over the other to place the aperture and the threaded opening of the nut in alignment with one another.

- (1) Note. The inherent resiliency of the "hinge" portion connecting the nut and apertured spacer is sometimes relied upon to increase the resistance of the nut to turning relative to the substructure.
- (2) Note. A plurality of spacers for the nut may be obtained by forming plural apertures in the stock material and then folding it over the appropriate number of times.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 147, for the reference to this subclass (170) appearing therein.

#### **171 Bolt or nut adapted to be fused directly to substructure (e.g., weld nut):**

This subclass is indented under subclass 166. Device wherein a bolt or nut is so formed or shaped (e.g., with one or more flanges, projections, etc.) or otherwise adapted to be united by fusion, without the benefit of additional material, to a substructure, the weld involving a mutual melting and flowing together of a portion of the material of the bolt or nut and a portion of the material of the substructure.

- (1) Note. The art of this subclass may claim only the subcombination of the bolt or nut.
- (2) Note. Prominent in the art of this subclass is a "weld nut" which is, most commonly, a metallic nut having one or more

projections (e.g., lugs) which are intended to be fused (e.g., by spot welding) to the substructure to unite the nut therewith.

SEE OR SEARCH THIS CLASS, SUBCLASS:

82, for a threaded fastener (i.e., a bolt or nut) and means for restricting the rotation thereof relative to a coacting substructure and wherein there is provided additional material which has a settable state; included therein is the fusible joining of a bolt or nut to a substructure if additional material (e.g., weld rod, chemical solvent) is utilized in doing so.

257, and 258, each as explained in the reference thereto appearing in subclass 82 above.

**172 Nut having a portion for attachment to substructure:**

This subclass is indented under subclass 166. Device wherein the structural characteristic comprises the formation of the nut, and of structure for retaining the nut in a particular relationship with an aperture that is formed in the substructure for the purpose of receiving the bolt, as a single element, and wherein the element makes contact with the substructure at one or more locations on each of its oppositely (i.e., outwardly) facing surfaces.

- (1) Note. Frequently, the substructure of the definition is one of two panels which are being joined in a facing relationship, the other panel having an aperture for receiving a bolt as it passes through that panel enroute to the first panel and its nut.

**173 Means to engage extends through aperture:**

This subclass is indented under subclass 172. Device wherein the single element rests, in part, against one of the surfaces of the substructure and has a portion (e.g., an arm, tongue, etc.) which passes through the aperture for the bolt enroute to establishing contact with the other surface of the substructure.

- (1) Note. The provision and utilization of at least one opening in the substructure, which opening is in addition to the aper-

ture for the bolt, for the passage of a portion which is the equivalent of the portion of this subclass, appears in subclass 172 above.

**174 Means to engage grasps an edge of substructure:**

This subclass is indented under subclass 172. Device wherein the single element is, at least in part, U-shaped for the purpose of being forced over an edge portion of the substructure.

- (1) Note. "Edge" refers to an outer boundary of the substructure, which substructure usually is in the nature of a panel.

**175 And has projection contacting periphery of aperture:**

This subclass is indented under subclass 174. Device wherein the single element includes, on one of the arms of the U, a detent, finger, lip, etc., directed toward the other arm for engaging the periphery of the aperture provided in the substructure for the bolt.

- (1) Note. The detent, etc., usually is for the purpose of anchoring the element until such time as the bolt can be threaded into the nut portion of the element.

**176 Fastener having a deformable portion or deforms substructure (e.g., prong):**

This subclass is indented under subclass 166. Device wherein the structural characteristic comprises the inclusion in one or more of the bolt or the nut or the substructure of at least one region (e.g., area, portion, etc.) which is inherently capable of (a) undergoing a significant change (e.g., a distortion) in configuration or shape, which change may be either elastic or plastic in nature, (b) causing such a change in another of the bolt, nut or substructure, or (c) causing such a change in another, and, either in reaction thereto or as a result of another force, undergoing a change in its own configuration or shape.

- (1) Note. The capability of one region for causing deformation in another region usually is a matter of the hardness of one relative to that of the other.

**177 Nut assembled to substructure utilizing cooperating regions on both:**

This subclass is indented under subclass 176. Device wherein a nut and a substructure, each having a deformable/deformation-producing region, are joined to one another, and wherein, as a result of the joining, the region of one deforms, or is deformed by, or both, the corresponding region of the other.

- (1) Note. The assembly with which this and the indented subclasses are concerned is that of the nut to the substructure prior to the threading of a bolt with the nut.

**178 Nut is externally and internally threaded cylinder:**

This subclass is indented under subclass 177. Apparatus wherein the nut is tubular in nature and is threaded on its outer surface, as well as internally, the outer thread serving to engage the nut with the substructure when the nut is inserted thereinto.

- (1) Note. Here, the nut is often the deformation-producing one of the cooperating members, and may, for example, deform the substructure by creating, in an untapped bore thereof, a thread mating with its own thread, or, if the bore is a tapped one, may be provided at some other location with a projection, such as a flange at its outermost end, for interfering with, and deforming, a region of the substructure.
- (2) Note. The external thread need not be continuous, and, in fact, may be fragmentary.

**179 Nut penetrates substructure and anchors itself thereto (e.g., pierce nut):**

This subclass is indented under subclass 177. Device wherein the nut contains a deformation producing region which, when cooperating with a tool couple in the nature of a ram and anvil, is adapted to act as a cutter or die and move against the substructure, or have the substructure moved against it, with sufficient force to create an opening in the substructure, which opening may (a) have its periphery, or portions thereof, bent or otherwise distorted (e.g., swaged) into a recess in an axially directed sur-

face of the nut for holding the nut fast to an axially directed surface of the substructure, (b) provide an entrance to the bore of the nut for the bolt which is to be received by the nut, (c) be sufficiently large to receive the overall radial dimensions of the nut and have its periphery forced radially inwardly to fixedly engage the nut along its radially outwardly facing surfaces and thus hold the nut in more or less coplanar relationship with the substructure, or (d) otherwise serve in anchoring the nut to the substructure.

- (1) Note. The substructure frequently is in the nature of a panel whose thickness is less than the axial dimension of the nut.
- (2) Note. The terms "clinching" or "clinch nut" appear occasionally in the art of this subclass (179). While the act of fastening a pierce nut to a substructure can properly be described as clinching, a clinch nut is distinguishable from a pierce nut on the basis that the former is intended to be anchored at a preexisting opening. On the other hand, the term "pierce or clinch nut", when properly applied, denotes a nut which can be utilized either (a) to pierce an opening and be clinched thereat or (b) to merely be clinched at an existing opening. Other collections of clinch nuts are found in subclasses 180 and 183 below.

**180 Nut deforms wall of preformed opening in substructure during assembly:**

This subclass is indented under subclass 177. Device wherein the substructure is provided with an aperture for the entry, in an axial direction, of the nut, or at least a portion of the axial dimension thereof, and wherein the substructure has a deformable region which comprises the periphery of the aperture, which periphery undergoes a change in configuration, radially, or axially, during or subsequent to the introduction of the nut thereinto.

- (1) Note. The change in configuration may be, for example, (a) a shearing off of portions of the wall of the aperture by the forcing thereinto of a nut having a serrated, radially outwardly facing surface, or (b) a bending out, from the plane of the substructure, of the material sur-



rounding the aperture (e.g., the substructure is a thin panel).

- (2) Note. The aperture in the instance of a substructure of greater thickness than the axial dimension of the nut may have an enlarged portion for the entry of the nut and another smaller portion for the passage of the bolt shank.
- (3) Note. It is not intended to include herein deformation of the substructure which takes place at a location removed from the periphery of the opening; e.g., by prongs or tangs depending from a radially outwardly extending flange formed on the nut.

SEE OR SEARCH THIS CLASS, SUBCLASS:

179, in regard to the reference to this subclass (180) appearing in (2) Note thereof.

**181 Both cooperating regions deformed:**

This subclass is indented under subclass 177. Device wherein the nut and the substructure each include a region which is capable of undergoing a significant change in configuration or shape and wherein the regions coact to undergo such a change as a result of the joining.

- (1) Note. The two regions may undergo change simultaneously, or the change may be sequential.

**182 Nonmetallic nut, resiliently deformable during assembly:**

This subclass is indented under subclass 177. Device wherein the nut is formed of other than metallic material (e.g., of an elastomeric composition) and is elastically distorted, momentarily or otherwise, while being joined to the substructure.

- (1) Note. The joining frequently involves the forcing of a mounting portion of the nut into an opening in the substructure which is somewhat smaller than the overall dimensions, radially, of that portion.

**183 Nut assembled to substructure by plastically deformable region on nut:**

This subclass is indented under subclass 176. Device wherein a nut which contains a deformable region is joined to the substructure by the permanent distortion of that region or a portion thereof.

- (1) Note. (1) Note of subclass 177 above is applicable here, also.

SEE OR SEARCH THIS CLASS, SUBCLASS:

179, in regard to the reference to this subclass (183) appearing in (2) Note thereof.

**184 Region on inwardly facing surface of bolt head or nut:**

This subclass is indented under subclass 176. Device wherein the deformable/deformation-producing region of either a bolt head or a nut occupies either a portion of or all of that surface thereof which confronts the substructure.

**185 Surface extends radially beyond flat sides of bolt head or nut:**

This subclass is indented under subclass 184. Device wherein the bolt head or the nut includes a plurality of planar, sidewardly facing surfaces (e.g., for engagement by a wrench), and wherein the inwardly facing (i.e., the working) surface of the bolt head or the nut is given a radial dimension which is greater than the distance separating opposite ones of the sidewardly facing surfaces.

**186 And includes resilient flange:**

This subclass is indented under subclass 185. Device wherein the greater radial dimension of the inwardly facing surface, or a portion of that dimension, is in the nature of an elastically deformable lip.

**187 Having axially directed projection or recess:**

This subclass is indented under subclass 184. Device wherein the substructure-confronting surface of the bolt head or the nut includes at least one formation (e.g., a ridge, stud, groove, hollow) which is raised or depressed in a direction more or less normally thereto.

**188 Plural, radially extending, and generally equally spaced:**

This subclass is indented under subclass 187. Device wherein the raised or depressed formations are two or more in number, are each located at, and extend along, a line which approximates a radian of the surface, and are spaced more or less the same distance apart around the surface.

**189 Surface deforms resiliently:**

This subclass is indented under subclass 184. Device wherein the deformation which occurs in the surface is elastic in nature.

**190 HAVING STRUCTURE TO RESTRICT ROTATION OF THREADED, MATING PIECES (E.G., NUT LOCK):**

This subclass is indented under the class definition. Device wherein an externally threaded element and an internally threaded element are matingly engaged through the medium of their threads, and wherein means is provided to restrict (i.e., limit or prevent) the rotation, in at least the unthreading direction, of one element relative to the other.

(1) Note. The means may range from as much as a plurality of discrete members to as little as the configuration of the thread of one of the elements; in the case of a plurality of such members, only one of the members may be directly involved in the restriction of rotation, the other, or others, often serving only an auxiliary function (e.g., retaining the one in its operative position).

(2) Note. Infrequently, the internally threaded element consists of at least two, more or less distinct, cooperating parts (e.g., an inner, internally threaded sleeve and, interengaged in some manner therewith, an outer shell, the latter ordinarily having flat surfaces for engagement by a wrench), in which instance the mating, threaded engagement required for this subclass is considered to be that of the inner part of the composite internally threaded element with the externally threaded element.

(3) Note. Classification in this and the indented subclasses is not precluded by the absence of a combination of the two threaded elements, as long as it is clear that the coupling means is intended for use with such a combination.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

81+, for a threaded fastener (i.e., a bolt or nut) and means for restricting the rotation thereof relative to a coacting substructure.  
166, in regard to the discussion therein of a peculiar kind of art for which classification in both areas 166+ and 190+ should be considered.

**191 Structure contacts nut piece side and is fixed to the nut:**

This subclass is indented under subclass 190. Device provided with one or more distinct members which restrict one of the threaded elements from rotating by bearing against or otherwise contacting at least one, more or less flat, radially outwardly facing surface of that threaded element, and which member, or at least one of them, also contacts the other threaded element in such a manner as to restrict it, too, from rotating.

**192 And contacts mating piece side:**

This subclass is indented under subclass 191. Device wherein the other threaded element includes at least one, more or less flat, radially outwardly facing surface, and at least one of the distinct members rests against or otherwise contacts one or more of the surfaces.

**193 Utilizing a resilient characteristic of the member, or of a discrete element:**

This subclass is indented under subclass 192. Device wherein either (a) an inherent property of resiliency on the part of at least one of the distinct members or (b) the presence of a distinct element having such a capability, is relied upon for either (1) moving the distinct member into or from its rotation restricting position or (2) keeping the distinct member from becoming separated from its operative association with one or the other of the threaded elements.

**194 With a discrete, resilient element:**

This subclass is indented under subclass 193. Device provided with a distinct element or device of a resilient nature for positioning or retaining the member.

**195 Other element is a bolt, and member includes opening configured to engage side flat thereon:**

This subclass is indented under subclass 192. Device wherein the other threaded element is the externally threaded one, and wherein at least one of the distinct members includes an aperture which is adapted by its configuration (e.g., a square hole) to contact one or more of the more or less flat, radially outwardly facing surfaces provided on the other threaded element.

**196 And further including spaced, axially extending legs for engaging side flats on the nut:**

This subclass is indented under subclass 195. Device wherein at least one of the distinct members includes, also, portions extending more or less normally to a plane containing the aperture and having radially inwardly facing regions for complementarily contacting the more or less flat, radially outwardly facing surfaces of the one (i.e., the internally) threaded element.

**197 Structure is coaxial, distinct member (e.g., washer) that restricts nut piece when fixed:**

This subclass is indented under subclass 191. Device wherein the one threaded element is the internally threaded one, and the at least one, more or less flat, radially outwardly facing surface is found on that threaded element.

**198 Utilizing a resilient characteristic of the member, or of a discrete element:**

This subclass is indented under subclass 197. Device wherein either (a) an inherent property of resiliency on the part of at least one of the distinct members or (b) the presence of a distinct element having such a capability, is relied upon for either (1) moving the distinct member into or from its rotation restricting position or (2) keeping the distinct member from becoming separated from its operative association with one or the other of the threaded elements.

**199 Member comprises key movable laterally into engagement with threaded elements:**

This subclass is indented under subclass 198. Device wherein at least one of the distinct members ordinarily comprises a pin, wedge, clip, dog, etc., which is inserted by movement from one side of the threaded elements toward, and more or less normally to, their longitudinal axis, which pin, etc., usually is received in part in each of the threaded elements and thus forms a positive interlock therebetween.

**200 Member comprises key movable laterally into engagement with threaded elements:**

This subclass is indented under subclass 197. Device wherein at least one of the distinct members ordinarily comprises a pin, wedge, clip, dog, etc., which is inserted by movement from one side of the threaded elements toward, and more or less normally to, their longitudinal axis, which pin, etc., usually is received in part in each of the threaded elements and thus forms a positive interlock therebetween.

**201 Member includes plastically deformable portion:**

This subclass is indented under subclass 197. Device wherein the distinct member, or one of them, includes at least one region which, when bent or otherwise reshaped, is adapted to remain in its changed configuration (i.e., the elastic limit of the material from which the member is formed has been exceeded).

- (1) Note. The reshaping may relate to the retaining of the member in its operative position, rather than to the member's function of restricting rotation.

**202 Utilizing a resilient characteristic of the member, or of a discrete element:**

This subclass is indented under subclass 191. Device wherein either (a) an inherent property of resiliency on the part of at least one of the distinct members or (b) the presence of a distinct element having such a capability, is relied upon for either (1) moving the distinct member into or from its rotation restricting position or (2) keeping the distinct member from becoming separated from its operative association with one or the other of the threaded elements.

**203 With a discrete, resilient element:**

This subclass is indented under subclass 202. Device provided with a distinct element or device of a resilient nature for positioning or retaining the member.

**204 Structure is coaxial, distinct member (e.g., washer, key, or nut portion) that restricts nut piece:**

This subclass is indented under subclass 190. Device provided with one or more distinct members having a capability of restricting the rotation of at least the internally threaded element, which member (or members) (a) is positioned outwardly, at least in part, of the internally threaded element (relative to the head end of the externally threaded element) and (b) cooperates with that outwardly facing portion of the internally threaded element to restrict the rotation thereof.

- (1) Note. The cooperation of the distinct member with the internally threaded element may involve anything from the engagement of a flat surface on one with a similar surface on the other to the interlocking of rather elaborate formations or both. Infrequently, the engagement may be that of an axially directed extension on either the element or the member within an axially facing recess (e.g., an annular one) in the member or element, respectively.

**205 Member includes pawl- or pivoting key-type portion engaging threads:**

This subclass is indented under subclass 204. Device wherein at least one of the distinct members ordinarily comprises a jointed pin, a hinged plate, a bendable rod, etc., which is foldable or otherwise turnable into a position in which it usually is received in part in each of the threaded elements for locking one to the other.

**206 Utilizing a resilient characteristic of the key, or of a discrete element:**

This subclass is indented under subclass 205. Device wherein either (a) an inherent property of resiliency on the part of the jointed pin, hinged plate, bendable rod, etc., or (b) the presence of a distinct element having such a capability, is relied upon for either (1) moving the

jointed pin, etc., into or from its locking position or (2) keeping the jointed pin, etc., from becoming separated from its operative association with one or the other of the threaded elements.

**207 With a discrete, resilient element:**

This subclass is indented under subclass 206. Device provided with a distinct element or device of a resilient nature for positioning or retaining the jointed pin, hinged plate, bendable rod, etc.

**208 And key engageable with aligned formations (e.g., grooves) in axially outwardly facing portion of each threaded element:**

This subclass is indented under subclass 207. Device wherein the jointed pin, hinged plate, bendable rod, etc., when in its locking position, rests in a channel, recess, slot, etc., formed in the axially outwardly facing portion of the internally threaded element and also in a similar formation, representing a prolongation of the first formation, in the corresponding portion of the externally threaded element.

**209 Member includes key, screw, tongue, etc. perpendicular to threads:**

This subclass is indented under subclass 204. Device wherein at least one of the distinct members ordinarily comprises a pin, wedge, clip, dog, etc., which is inserted by movement from one side of the externally threaded and the internally threaded elements toward, and more or less normally to, their longitudinal axis, which pin, etc., usually is received in part in each of the threaded elements and thus forms a positive interlock therebetween.

**210 Utilizing a resilient characteristic of the key, or of a discrete element:**

This subclass is indented under subclass 209. Device wherein either (a) an inherent property of resiliency on the part of the pin, wedge, clip, dog, etc., or (b) the presence of a distinct element having such a capability, is relied upon for either (1) moving the pin, etc., into or from its locking position or (2) keeping the pin, etc., from becoming separated from its operative association with one or the other of the threaded elements.

**211 With a discrete, resilient element:**

This subclass is indented under subclass 210. Device provided with a distinct element or device of a resilient nature for positioning or retaining the pin, wedge, clip, dog, etc.

- (1) Note. Frequently, the distinct element is a coil spring.

**212 Including plastically deformable portion:**

This subclass is indented under subclass 209. Device wherein the pin, wedge, clip, dog, etc., has at least one region which, when bent or otherwise reshaped, is adapted to remain in its changed configuration (i.e., the elastic limit of the material from which the pin, etc., is formed has been exceeded).

- (1) Note. The reshaping may relate to the retaining of the member in its operative position, rather than to the member's function of restricting rotation.

**213 Comprising an elongated element divided longitudinally (e.g., a cotter pin):**

This subclass is indented under subclass 212. Device wherein the element is in the nature of a pin and is split along its longitudinal axis through a substantial portion of its length.

**214 Member includes screw receivable in an axially extending, internally threaded bore:**

This subclass is indented under subclass 204. Device wherein the member takes the form of a screw (e.g., a machine screw) and engages the axially outwardly facing portion of the internally threaded element either by way of a head formed on the screw or by way of an additional member located between, and cooperating with, the screw and the portion, and further wherein the externally threaded element is provided with a bore which is internally threaded and extends more or less longitudinally of the element, which bore receives at least a portion of the shank of the screw.

**215 With an additional member between screw and axially outwardly facing portion:**

This subclass is indented under subclass 214. Device provided with an additional member (e.g., an apertured plate, a washer, etc.) located in intervening relationship to the screw and the axially outwardly facing portion of the inter-

nally threaded element, thereby substituting for, or supplementing, the screw in engaging that portion.

**216 Member or portion includes an axially disposed key:**

This subclass is indented under subclass 204. Device wherein at least one of the distinct members consists in large part of a portion resembling a dowel, pin, rod, etc., which portion is positioned generally parallel to the longitudinal axis of the threaded elements and usually is received in part in each of them, thus tending to form a positive interlock therebetween.

**217 Key coacts with bolt by occupying an axially extending recess formed in the radially outward surface thereof:**

This subclass is indented under subclass 216. Device wherein the externally threaded element receives the elongated portion of the member in a recess formed in its outer surface and extending longitudinally thereof.

**218 And includes a portion adapted to extend into a transverse opening provided in the bolt:**

This subclass is indented under subclass 217. Device wherein the member includes a footlike portion extending at more or less a right angle to the remainder thereof for entering an opening formed into or through the externally threaded element at about 90° to the longitudinal axis thereof.

- (1) Note. The footlike portion frequently performs a retaining function.

**219 And includes a portion adapted to engage a substantial part of the periphery of the bolt:**

This subclass is indented under subclass 217. Device wherein the member includes a portion which is circular or partly circular in configuration, or can be shaped into such a configuration, for engaging the externally threaded element along a path representing the circumference, or a significant part of the circumference, thereof.

**220 And includes a region plastically deformable into engagement with the axially outwardly facing portion:**

This subclass is indented under subclass 217. Device wherein at least that part of the member which is intended to engage the axially outwardly facing portion of the internally threaded element is bent or otherwise deformed beyond its elastic limit when moved into engagement with that portion.

**221 Member or portion includes piece that interlocks with an axially extending recess or slot in a bolt and a recess in an axially outwardly facing side of a nut:**

This subclass is indented under subclass 204. Device wherein the member includes a formation in the nature of a radially inwardly directed projection for entering a groove or related opening formed in the externally threaded element and extending parallel to the longitudinal axis thereof, and also includes another formation whereby it engages against rotation a depressed region in the axially outwardly facing portion of the internally threaded element.

- (1) Note. The first mentioned formation usually has only a minimal axial dimension.
- (2) Note. The second mentioned formation often comprises the configuration of the outer periphery of the member.

**222 Internally threaded locking member (e.g., jam nut):**

This subclass is indented under subclass 204. Device wherein at least one of the distinct members comprises a second internally threaded element which is in threaded engagement with the externally threaded element and is located axially outwardly, at least in part, of the first (i.e., the primary) internally threaded element.

- (1) Note. While the thread gripping locking members of subclasses 246+ below sometimes engage the thread of the externally threaded element in a manner similar to that of the member of this and the indented subclasses, the engagement there (246+) should be, at a maximum,

somewhat less than  $360^\circ$ . If the threaded engagement of the member with the externally threaded element takes place through  $360^\circ$  or more, classification in this subclass (222) and the indented subclasses is indicated.

**223 Including means associated with at least one of the nuts for restricting rotation therebetween:**

This subclass is indented under subclass 222. Device which includes means (a) formed on or carried by one or both of the internally threaded elements, (b) consisting of another distinct member and located between the elements, or (c) otherwise associated with the elements, which means limits or prevents (\*) the turning of one of the elements with respect to the other. (\*) It should be observed that, in the jam nut art, the ceasing of further turning of the internally threaded elements relative to one another may mean that no greater degree of coupling can be attained than that which existed at the time that the two elements commenced to move as one.

**224 Key received in part in each of the nuts:**

This subclass is indented under subclass 223. Device wherein the means comprises a distinct member, such as a pin, a portion of which resides in each of the internally threaded elements.

**225 Including a plastically deformable portion:**

This subclass is indented under subclass 224. Device wherein the member includes at least one region which, when bent or otherwise reshaped, is adapted to remain in its changed configuration (i.e., the elastic limit of the material from which the member is formed has been exceeded).

- (1) Note. The reshaping may relate to the retaining of the member in its operative position, rather than to the member's function of preventing relative rotation.

**226 Received in axially extending passages or recesses:**

This subclass is indented under subclass 224. Device wherein one portion of the member occupies at least a portion of a groove, hole, slot, etc., which generally parallels the longitudinal axis of one of the internally threaded ele-

- ments, and another portion of the member occupies a similar formation in the other element.
- 227 Comprising one or more discrete members serving as a pawl and ratchet:**  
This subclass is indented under subclass 223. Device wherein the means comprises one or more distinct members of which (a) one is either a pawl (e.g., a biased arm, dog, finger, etc.) or a ratchet (e.g., a series of teeth of asymmetrical profile), in which event the counterpart ratchet or pawl, respectively, is an integral part of one of the internally threaded elements, or (b) one member is a pawl and another member is a ratchet and each is carried, at least in part, either by one of the elements or by yet another member cooperating with that element, and wherein, in either (a) or (b), the function of the pawl and ratchet is to restrict rotation to a greater degree in one direction than in the other.
- (1) Note. A pawl carried by, for example, a washer constitutes subject matter for this subclass.
- 228 Inherently resilient pawl:**  
This subclass is indented under subclass 227. Device wherein the source of bias for the pawl is the use of material (e.g., sheet metal) having a significant degree of elasticity for fashioning the pawl.
- 229 Axially directed, resiliently biased detent means:**  
This subclass is indented under subclass 223. Device wherein the internally threaded elements are secured against relative rotation by spring urged, depressible protuberance means which are carried by one of the internally threaded elements and which are adapted to be received in recess means in the other such elements.
- 230 Canted element:**  
This subclass is indented under subclass 223. Device wherein either of the internally threaded elements or a washer in association therewith is wedge-shaped or has eccentrically arranged protuberance means thereon which causes the elements in the assembly to become tilted with respect to each other, thereby producing a binding of the mating threads.
- 231 With means resiliently biasing the nuts apart:**  
This subclass is indented under subclass 223. Device wherein the internally threaded elements are urged in axially opposite directions by a springlike force to cause frictional binding with the threads of the externally threaded element.
- (1) Note. The resilient bias may be inherent in the material from which the elements are formed.
- 232 Side lock:**  
This subclass is indented under subclass 223. Device wherein the internally threaded elements are secured against relative rotation by means cooperating with one or more sidewardly facing, substantially planar surfaces on at least one of the elements.
- 233 Integral deformable means:**  
This subclass is indented under subclass 232. Device wherein the side lock comprises a portion of the unitary structures of one of the internally threaded elements, which portion is deformed beyond its elastic limit into engagement with a side surface of the other of the internally threaded elements.
- 234 By a discrete element:**  
This subclass is indented under subclass 232. Device wherein the side lock comprises an element which is separate and distinct from the internally threaded elements.
- (1) Note. Included herein is a side lock which is spring biased into engagement with the elements.
- 235 Periphery encompassing means (e.g., a sleeve):**  
This subclass is indented under subclass 234. Device wherein the side lock comprises an element which surrounds at least a part of each of the internally threaded elements.
- 236 Including plastic deformation (e.g., bending) of the discrete element:**  
This subclass is indented under subclass 234. Device wherein the side lock element assumes its locking position by being deformed beyond its elastic limit.

**237 Having a part of one or the nuts extending into a circular, axially directed recess of the other, and further including, in the region of the recess, formations cooperating to restrict relative rotation:**

This subclass is indented under subclass 223. Device wherein one of the internally threaded elements includes an axially directed portion which enters an axially directed enlargement of part of the axial dimension of the opening provided in the other internally threaded element for receiving the externally threaded element, and wherein the elements include, within the axial dimension common to both, structural features which coact to limit or prevent the turning, in at least one direction, of one of the elements with respect to the other.

- (1) Note. Infrequently, another distinct member (see subclass 223 above) is located within the axial dimension common to both of the internally threaded elements and contributes to the limiting or preventing of turning.

**238 At least one of the formations comprises a surface eccentric to the longitudinal axis of the nuts:**

This subclass is indented under subclass 237. Device wherein one of the structural features is a surface generated about an axis (or axes, if of varying curvature) which is offset from the longitudinal axis of the elements, and further wherein a slight rotation of one of the elements relative to the other brings that surface into binding engagement with a surface on the other element, which latter surface either is not eccentric or, if eccentric, is of a different eccentricity.

- (1) Note. The engagement of the member (here, the secondary internally threaded element) with the axially outwardly facing portion of the internally threaded element (here, the primary such element) required by subclass 204 may be somewhat remote in the art of this subclass (238); however, the eccentricity proposition involved appears sufficiently peculiar to the jam nut concept to warrant its inclusion with that art.

**239 Including cooperating formations on the axially opposing portions of the nuts:**

This subclass is indented under subclass 223. Device wherein both of the internally threaded elements are formed with, on the portions thereof which occupy an axially confronting relationship, surface configurations which interact with each other to limit or prevent the turning, in at least one direction, of one of the elements with respect to the other.

- (1) Note. Infrequently, another distinct member (see subclass 223 above) is located between the internally threaded elements and contributes to the limiting or preventing of turning (e.g., by providing one of the confronting sets of surface configurations).

**240 Comprising teeth of the ramp and buttress type:**

This subclass is indented under subclass 239. Device wherein the surface configurations formed on each internally threaded element comprise a plurality of projections of the kind which, in profile, display a gradual slope leading to the outermost region of the projection followed by a sharp (e.g., a perpendicular) drop to a base line.

**241 Comprising surfaces of a curvilinear nature:**

This subclass is indented under subclass 239. Device wherein the surface configurations formed on each internally threaded element are rounded or undulating in character.

- (1) Note. The interaction of the surface configurations may involve only certain portions thereof at any one rotational position of the elements relative to one another.

**242 Plastic deformation of at least one of the nuts:**

This subclass is indented under subclass 223. Device wherein the means preventing rotation between the internally threaded elements comprises a portion of one of the elements being deformed beyond its elastic limit.



- material from which the locking member is formed.
- 243 Reversed internal and external threads on one of the nuts:**  
This subclass is indented under subclass 223. Device wherein one of the internally threaded elements is formed with external threads of a hand opposite to its internal thread which are adapted to be engaged by either the other of the internally threaded elements or by an extraneous locking means.
- 244 Oppositely threaded:**  
This subclass is indented under subclass 223. Device wherein one of the internally threaded elements has a right-hand thread while the other has a left-hand thread, and the externally threaded element includes threaded portions mating with each of them.
- 245 Intersecting threads on the bolt:**  
This subclass is indented under subclass 244. Device wherein the right-hand and left-hand threads on the externally threaded element are formed in overlapping relationship so as to define a crossed-threaded arrangement.
- 246 By thread-gripping locking element:**  
This subclass is indented under subclass 204. Device wherein at least one of the distinct members comprises an element which exerts a tight holding action, usually at circumferentially spaced locations, upon the thread of at least one of the threaded elements.
- (1) Note. The thread which is gripped by the member ordinarily is that of the externally threaded element.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
222, and see (1) Note thereof for the line between the member of that subclass (222) and the member of this subclass (246).
- 247 Resilient grip:**  
This subclass is indented under subclass 246. Device wherein the locking member is urged into engagement with the threads by spring biasing means.
- (1) Note. The spring biasing means may comprise the inherent resiliency of the
- 248 Split ring:**  
This subclass is indented under subclass 247. Device wherein the locking member comprises a resilient element which defines the major portion, but less than all, of a normally closed figure such as an annulus or a polygon.
- (1) Note. The break in the figure sometimes serves to facilitate assembly of the element with the threaded elements.
- 249 Including structure interfitting within a thread for less than a full turn thereof:**  
This subclass is indented under subclass 248. Device wherein the split ring includes a thin, radially inwardly facing projection which enters into a turn of the thread of the threaded element and follows that thread through something less than  $360^\circ$ .
- (1) Note. The projection may be discontinuous (e.g., a series of inwardly directed prongs or tongues).
- 250 Wire structure:**  
This subclass is indented under subclass 246. Device wherein the locking member is formed from a stock material in the nature of a thin, metal rod which is resiliently flexible.
- 251 Helically coiled wire:**  
This subclass is indented under subclass 250. Device wherein the wire locking member is wound into a spiral element.
- 252 Including a fee end in nonrotational engagement with the threaded element:**  
This subclass is indented under subclass 251. Device wherein the coiled wire locking member includes an end portion cooperating with means on the internally threaded element to prevent relative rotation between the locking member and said element.
- 253 Gripping member includes a tapered section adapted to be axially depressed to cause radial movement of a portion thereof:**  
This subclass is indented under subclass 246. Device wherein the locking member is formed with an axially extending portion which is inclined with respect to the axis of the threaded

elements and wherein a free end of said portion is caused to be moved into engagement with the thread on one of the threaded elements upon the application of an axially directed force to said portion.

- (1) Note. The tapered section may include inwardly directed tang means.

**254 Gripping member is moved radially into engagement with the threads:**

This subclass is indented under subclass 246. Device wherein the locking member assumes the thread gripping position upon being moved toward or from, and generally perpendicular to, the axis of the threaded elements.

- (1) Note. The member is sometimes moved into its gripping position by applying a radially inwardly directed force for constricting its periphery.

**255 Including discrete means to move or to lock the gripping member relative to the externally threaded element:**

This subclass is indented under subclass 254. Device wherein an additional element is provided which either moves the locking member to cause it to grip the externally threaded element, or secures it in that position, or both.

- (1) Note. The means is sometimes applied by moving it in an axial direction.

**256 Gripping member is moved tangentially into engagement with the threads:**

This subclass is indented under subclass 246. Device wherein the locking member assumes a holding position by being moved into engagement with the threaded element along a path which lies in planes both perpendicular and parallel to the axis of said element.

**257 Including material in the nature of (1) a metallic coating, (2) a quantity of fusible metal or (3) a discrete member formed of ductile material:**

This subclass is indented under subclass 190. Device wherein the means comprises or includes either (a) a metallic composition which has been applied as a layer on the surface of at least a part of the interengaging portions of the threaded elements, (b) a supply, or a member, of a metal which is subjected to

melting and rehardening or (c) a distinct member of a metal which is sufficiently soft (e.g., malleable) as to yield upon the application of a relatively small amount of force.

**258 Including settable material:**

This subclass is indented under subclass 190. Device wherein the means comprises or includes a quantity of a substance which is hardenable from the relatively soft or flowable state in which it is applied to at least one of the threaded elements into a firm or rigid state in which it holds, or assists in holding, the threaded elements against rotation relative to one another.

- (1) Note. Included herein, for example, is the use of an adhesive to create a force tending to hold two parts together, or the use of a chemical solvent which, with or without the assistance of a physical treatment (e.g., heat) molecularly intermingles with and unites two parts.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 257, for a threaded bolt and nut coupled against rotation by means which may include metallic material of a fusible nature.

**259 Comprising a thread lock:**

This subclass is indented under subclass 190. Device wherein the rotation restricting means comprises either the thread structure of one of the other of the threaded elements, or the interaction of the threads of one element upon the threads of the other element, or the action of an additional element upon the threads of one or the other or both of the threaded elements.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 167, for a threaded fastener (i.e., a bolt or nut) and means for restricting the rotation thereof relative to a coacting substructure and wherein the means comprises the structure of the bolt, nut or substructure and further wherein a bolt-to-nut thread lock is also provided; see also the search notes of that subclass for other subclasses of this class which include a thread lock.

- 222+, for a coupled bolt and nut which includes a rotation restricting member which coacts with the axially outwardly facing portion of the internally threaded element and wherein that member is an additional internally threaded element, in which art, it may be observed, the action of one internally threaded element upon the other, and the resultant reaction of each upon the thread of the externally threaded element, often is the basis for the coupling achieved.
- 260 Including a distortable metallic washer or sleeve:**  
This subclass is indented under subclass 259. Device wherein the rotation restricting means includes a substantially annular member of more or less readily deformable metal which is disposed in concentric relationship with the threaded elements and moves, upon deformation, into tight engagement with the threads of at least one of the elements.
- 261 In the nature of a dished washer:**  
This subclass is indented under subclass 260. Device wherein the member is a washer which is concave on one of its axially directed faces and is adapted (e.g., by having a convex, opposite face) to be axially collapsed by the application of a compressive force, thus causing its inner and outer peripheries to shift radially, at least one of them moving into engagement with the threads on one of the threaded elements.
- 262 Including a coil spring:**  
This subclass is indented under subclass 259. Device wherein the rotation restricting means includes a helically wound resilient wire which grips the threads on one or both of the threaded elements.
- 263 Differential thread means:**  
This subclass is indented under subclass 259. Device wherein a discrete locking member is provided with threads which engage complementary threads on either of the threaded elements causing the mating threads on said elements to be biased axially into tight, frictional engagement.
- (1) Note. The threads on the locking member may be of a different pitch and/or
- hand from those on the mating threaded elements.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
312, in regard to the reference to this subclass (263) appearing in (1) Note thereof.
- 264 Rocking thread section on the externally threaded element:**  
This subclass is indented under subclass 259. Device wherein the externally threaded element includes a section of the threads which comprises a separate element, pivotal between a position wherein the leading threads thereon are within the confines of the adjacent threads on the element and a second position, initiated by engagement with the internally threaded element, wherein at least said leading threads extend radially beyond said adjacent threads.
- 265 Including a tapered (e.g., conical) surface for wedging the internally threaded element against the externally threaded one:**  
This subclass is indented under subclass 259. Device wherein the rotation restricting means includes a surface which extends at an acute angle to the longitudinal axis of the threaded elements, which surface is engaged by the internally threaded element in such a manner that movement on the part of that element causes it to be forced into ever-tighter engagement with the externally threaded element.
- (1) Note. The surface is usually one of revolution, such as a cone, and may be either interrupted (i.e., a segmented cone) or continuous.
- (2) Note. The surface most often is smooth, but is, in some instances, threaded.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
237, for a coupled bolt and nut which includes a rotation restricting member which coacts with the axially outwardly facing portion of the internally threaded element, and wherein that member is an additional internally threaded element, and further wherein there is included a means to restrict the rotation of one internally threaded

element relative to the other one, and additionally wherein the latter means comprises the extending of a portion of one of the elements into a recess of the other element, which portion and recess, it may be observed, sometimes involve a conical interface.

**266 Segmented internally threaded element:**

This subclass is indented under subclass 265. Device wherein wedging of the threads is facilitated by the internally threaded element being longitudinally split.

- (1) Note. The splitting may divide the element into segments which are separate and distinct.

**267 Discrete segments carried within a housing:**

This subclass is indented under subclass 266. Device wherein the internally threaded element is split into segments which are separate and distinct and are disposed within a hollow body member.

**268 Including a discrete, threaded member carrying the tapered surface and threadedly engaging one of the threaded elements:**

This subclass is indented under subclass 266. Device wherein the tapered surface is a portion of a distinct member, which member is threaded and is in threaded engagement with either the externally threaded element or the internally threaded element.

**269 Engaging a threaded exterior provided on the segmented element:**

This subclass is indented under subclass 268. Device wherein the distinct member is in threaded engagement with a thread formed on the outer surface of the internally threaded element.

**270 Including a sleeve or washer type member for carrying the tapered surface and surrounding the segmented element:**

This subclass is indented under subclass 266. Device wherein the tapered surface is a portion of a distinct member which is annular, is of a greater or a lesser axial dimension than the internally threaded element, and has an open, axially outwardly facing end to enable insertion and removal of that element.

- (1) Note. The tapered surface may be provided with means for engaging, against rotation, the openings which resulted from splitting the internally threaded element.

**271 Externally threaded element includes an axially extending opening in its free end for receiving an expander member:**

This subclass is indented under subclass 259. Device wherein the externally threaded element includes, in that end which is opposite its headed end, a longitudinal bore, cavity, slot, etc., into which a distinct member of nonuniform thickness (e.g., a cone, a wedge, etc.) is moved for forcing a portion of the thread of that element generally radially outwardly against a corresponding portion of the thread of the internally threaded element.

- (1) Note. While the distinct member ordinarily is a component of the bolt and nut assembly, in rare cases it is a spreader tool (e.g., a chisel) which is associated with the assembly only momentarily.
- (2) Note. While the distinct member frequently is driven into the externally threaded element by axially directed blows, it is sometimes pulled or pushed thereinto by the turning of the elements into threaded interengagement.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 325, for a structurally similar opening and member, but wherein the expansion of the externally threaded element does not take place in the region of its threaded interengagement with the other element.

**272 Including camming surfaces on the threaded elements or on an additional member:**

This subclass is indented under subclass 259. Device wherein eccentrically arranged surfaces on either the internally or externally threaded elements or on a washer element cause the mating threads to bind upon relative rotation between the elements.

**273 With a camming member having an eccentrically arranged recess for receiving the internally threaded element:**

This subclass is indented under subclass 272. Device wherein a discrete camming member is provided having at least one end of the internally threaded element disposed therein and wherein the camming member and the threaded elements are provided with cooperating camming surfaces.

**274 Having an element, or with a discrete member, adapted to cant the assembly:**

This subclass is indented under subclass 259. Device wherein either the internally threaded element, the externally threaded element, or an additional member in association therewith, is wedge-shaped, has eccentrically arranged protuberance means thereon, or is otherwise adapted to cause the elements in the assembly to become tilted with respect to each other, thereby producing a binding of the mating threads.

**275 With a discrete, canting member (e.g., a washer):**

This subclass is indented under subclass 274. Device wherein an additional member is provided for effecting the canting of the assembly, which member may be in the nature of a washer.

**276 Having the internally threaded element distorted:**

This subclass is indented under subclass 259. Device wherein the internally threaded element is physically deformed either before, during, or after its application to the externally threaded element to cause the mating threads to become lockingly engaged.

**277 Radially inward distortion:**

This subclass is indented under subclass 276. Device wherein the internally threaded element is deformed in a direction toward, and generally perpendicular to, the longitudinal axis of the element.

**278 With discrete means carried by the element for producing the distortion:**

This subclass is indented under subclass 277. Device wherein the internally threaded element carries a separate means by which the element is deformed.

- (1) Note. In the event the discrete means comprises an "additional internally threaded element" within the meaning of subclasses 222+ above, classification there is proper.

SEE OR SEARCH THIS CLASS, SUBCLASS:

222+, as explained in the reference thereto appearing in (1) Note above.

**279 Threaded means:**

This subclass is indented under subclass 278. Device wherein the distortion producing means comprises a threaded member which is received in a substantially radially extending, threaded aperture in the internally threaded element.

**280 Of cantilevered segments (e.g., castlabeled end):**

This subclass is indented under subclass 277. Device wherein the distorted portion of the internally threaded element comprises sections at one end thereof defined by circumferentially spaced, axially outwardly facing slots.

SEE OR SEARCH THIS CLASS, SUBCLASS:

266+, for an internally threaded element of this area (259+) which is of the segmented type and wherein a conical surface is provided for wedging the segments toward an externally threaded element.

**281 Of circumferentially spaced areas of continuous periphery:**

This subclass is indented under subclass 277. Device wherein the internally threaded element is deformed inwardly at locations spaced about an uninterrupted periphery thereof.

**282 Defining a smooth curving, noncircular thread section (e.g., elliptically shaped):**

This subclass is indented under subclass 281. Device wherein the spaced, deformed portions blend smoothly into the adjacent areas of the element to define the peripheral extent of the threads as a noncircular, curvilinear configuration.

SEE OR SEARCH THIS CLASS, SUBCLASS:

291, and see the reference in (1) Note thereof to a noncircular, threaded opening.

**283 Impacted areas:**

This subclass is indented under subclass 281. Device wherein the spaced, deformed portions are the result of impacts applied in the vicinity of each portion, thus causing the threads there to be forced inwardly.

**284 Located on the flats of a polygonally shaped element:**

This subclass is indented under subclass 283. Device wherein the outer periphery of the internally threaded element is defined in cross section by a geometric figure comprising a plurality of angularly related flat sides and wherein the impacted areas are located on respective ones of those sides.

**285 Axial distortion:**

This subclass is indented under subclass 276. Device wherein the internally threaded element is deformed in a direction generally parallel to its longitudinal axis.

**286 With discrete means carried by the element for producing the distortion:**

This subclass is indented under subclass 285. Device wherein the internally threaded element carries a separate means by which it is deformed.

- (1) Note. In the event the discrete means comprises an "additional internally threaded element" within the meaning of subclasses 222+ above, classification there is proper.

SEE OR SEARCH THIS CLASS, SUBCLASS:

222+, as explained in the reference thereto appearing in (1) Note above.

**287 By axially directed impacted areas:**

This subclass is indented under subclass 285. Device wherein the distortion comprises areas of the endwalls of the element having the material thereof compressed in a direction substantially parallel to the longitudinal axis of said element, resulting in the convolutions of corresponding thread portions being moved closer together to define a reduced pitch in said portions.

**288 Of axially spaced threaded sections:**

This subclass is indented under subclass 285. Device wherein the distortion is applied to portions of the thread which are spaced apart in a longitudinal direction by undeformed thread portions.

**289 Coiled spring:**

This subclass is indented under subclass 288. Device wherein the distorted internally threaded element is in the form of a helically wound wire.

**290 Including a region displaceable generally axially relative to another part of the element:**

This subclass is indented under subclass 285. Device wherein the internally threaded element includes at least one region which is shiftable (e.g., by bending into a void) in a direction more or less parallel to the longitudinal axis of the element with respect to another part (e.g., remainder) of the element for setting up a binding action between at least some of the threads of that element and the threads of the externally threaded element.

- (1) Note. In most instances, the region includes at least one thread for engaging the externally threaded element.
- (2) Note. The shifting sometimes results from the advancing movement of the externally threaded element through the internally threaded element, but may result, instead, from the region being

collapsed as it is forced against a sub-structure.

**291 Having at least one region formed by a cut, slot, etc., across at least one sidewall of the element and extending generally radially into the element:**

This subclass is indented under subclass 290. Device wherein at least one shiftable region is created by forming a generally planar void (e.g., by a saw cut, by a preformed lip, etc.) which starts in one or more of the sidewalls and extends into and part way through the element in a direction more or less normally to the longitudinal axis of the element.

- (1) Note. While the art of this subclass emphasizes the binding action which results from the threads of the region being moved axially relative to the threads of another part of the element, it is occasionally disclosed that this movement (ordinarily by bending) results in the threads of the region presenting an other-than-exactly-circular opening for receiving the threads of the bolt.

**292 Including a longitudinal locking member:**

This subclass is indented under subclass 259. Device which includes a member in the nature of a key which extends substantially parallel to the axis of the threaded elements and bites into or binds against the threads of one or the other of the elements.

**293 Having a toothed surface:**

This subclass is indented under subclass 292. Device wherein that portion of the key which engages the threads is formed with protuberance means.

- (1) Note. The protuberance means may either mate with or bite into the threads.

**294 Including a radial locking member:**

This subclass is indented under subclass 259. Device which includes a member in the nature of a key which is moved radially into engagement with the threads of the externally threaded element.

**295 Threadedly received in the internally threaded element:**

This subclass is indented under subclass 294. Device wherein the key is threadedly carried in a radially disposed bore in the internally threaded element.

**296 Side clutch:**

This subclass is indented under subclass 259. Device wherein a discrete locking member bites into the threads on either of the threaded elements with the locking action resembling that of a pawl and ratchet except that said threads have no cooperating notches.

- (1) Note. The engagement of the member of this subclass (296) with the threaded element hereof is somewhat similar to that of the member and element of subclass 300 below, except that here there is toothed contact while in subclass 300 there is only line contact.

**297 Roller:**

This subclass is indented under subclass 296. Device wherein the locking member is substantially cylindrical or conical and is disposed in rolling engagement with a cam surface for moving the member into binding engagement with the threads.

**298 Ball:**

This subclass is indented under subclass 296. Device wherein the locking member is spherical and cooperates with a cam surface for moving the member into binding engagement with the threads.

**299 Spring:**

This subclass is indented under subclass 296. Device wherein the locking member is resilient in nature.

**300 Tangential locking member:**

This subclass is indented under subclass 259. Device which includes a member in the nature of a key which is carried by the internally threaded element and engages the thread on the externally threaded element along a straight line disposed substantially parallel to the pitch of the thread.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
 296, in regard to the comparison in (1) Note thereof of the member-to-element contact in the respective subclasses.
- 301 Elastic gripping action:**  
 This subclass is indented under subclass 259. Device wherein at least one of the threaded elements or a member (e.g., a washer, sleeve, etc.) in combination therewith is composed wholly or partly of an elastomeric material which frictionally grips one of the threads.
- (1) Note. The elastomeric material may comprise a coating of such material on one or more of the threaded surfaces.
- 302 Elastic insert:**  
 This subclass is indented under subclass 301. Device wherein the elastomeric material comprises an element of that material carried by one of the threaded elements.
- 303 Disposed in a counterbore in the internally threaded element:**  
 This subclass is indented under subclass 302. Device wherein the elastomeric material is carried in a circumferentially extending counterbore which is concentric with the threaded bore of the internally threaded element.
- 304 Disposed within an interruption of a threaded surface:**  
 This subclass is indented under subclass 302. Device wherein the elastomeric material is carried within a recess or aperture which is within the threaded area thereby rendering the threads discontinuous.
- 305 Externally threaded element adapted to be compressed radially inwardly:**  
 This subclass is indented under subclass 259. Device wherein the externally threaded element is so formed (e.g., with a threaded portion which has a hollow core, with a threaded portion which is slotted longitudinally, etc.) that its engagement with a mating internally threaded element results in at least some displacement of its threaded surface in a direction toward its longitudinal axis.
- 306 Resilient element:**  
 This subclass is indented under subclass 305. Device wherein the externally threaded element, or at least the threaded portion thereof, is sufficiently resilient in nature (i.e., has a sufficiently high limit of elasticity) that, upon removal of the internally threaded element, it expands outwardly to its previous dimension.
- 307 Having threads of different pitch, or a thread of varying pitch:**  
 This subclass is indented under subclass 259. Device wherein the locking is occasioned by either (a) the use of a thread frequency on one of the threaded elements which is greater or less than the thread frequency of the other threaded element or (b) the use, on one of the threaded elements, of a thread frequency which is different in one longitudinal region of the element than in another longitudinal region thereof.
- 308 Involving dissimilarities in the sectional configuration of the threads:**  
 This subclass is indented under subclass 259. Device wherein the locking is occasioned by a sufficient departure, on the part of the thread of one of the threaded elements, from the shape, in cross section, of the thread of the other threaded element, that the two threads will no longer operatively engage with one another without binding to one degree or another.
- (1) Note. The cross-sectional shape is that displayed by a section containing the longitudinal axis of the elements.
- 309 Resulting in the deformation of one thread by the other:**  
 This subclass is indented under subclass 308. Device wherein one of the threads distorts the other thread to an extent which exceeds its elastic limit.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
 277+, for deformation of the thread of an internally threaded element (i.e., a nut) resulting from radially inwardly distortion of the element.  
 285+, for deformation of the thread of an internally threaded element (i.e., a



nut) resulting from axial distortion of the element.

**310 By integral, interference-producing deviations from a standard thread shape:**

This subclass is indented under subclass 309. Device wherein the distortion is produced by the presence, on at least one of the threads, of regions, integral with the material of the thread, which extend beyond, at one or more locations, the cross-sectional shape of a standard (e.g., a  $60^\circ$ ) thread.

- (1) Note. Included herein is art wherein the deviation comprises the use of different flank angles on the threads (i.e., the included angle of one of the threads is not the same as the included angle of the other thread).

**311 Located in the vicinity of the crest or the root of the thread:**

This subclass is indented under subclass 310. Device wherein the regions occur either at the major, or the minor, diameter of the thread.

**312 Including means biasing the threads in axially opposed directions:**

This subclass is indented under subclass 259. Device wherein the mating threads are forced into frictional engagement by means urging the respective threads in opposed longitudinal directions.

- (1) Note. The means is sometimes a discrete locking member as in subclass 263 above; if it is, however, it is not a threaded member, as is the case there (263).

**313 Washer having a deformable portion engageable with a threaded element:**

This subclass is indented under subclass 190. Device wherein a washer element is provided having a portion which is bent or otherwise deformed into locking engagement with one of the threaded elements.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 201, for a coupled bolt and nut provided with one or more distinct member which restrict rotation by engaging at least one, more or less flat, radially

outwardly facing surface of the internally threaded element, and wherein the member, or one of them, includes a region which is bent or otherwise reshaped, plastically, into engagement with such a surface, which member frequently is in the nature of a washer.

**314 Resiliently deformable portion:**

This subclass is indented under subclass 313. Device wherein deformation of the washer is within the elastic limit of the material of said washer.

**315 With a member in the nature of a rotation preventing key movable laterally into engagement with the threaded elements:**

This subclass is indented under subclass 190. Device provided with one or more distinct members having a rotation restricting capability and ordinarily comprising a pin, wedge, clip, dog, etc., which pin, etc., is inserted by movement from one side of the threaded elements toward, and more or less normally to, their longitudinally axis and usually is received in part in each of the threaded elements, thus tending to form a positive interlock therebetween.

**316 And utilizing a resilient characteristic of the key, or of a discrete element:**

This subclass is indented under subclass 315. Device wherein either (a) an inherent property of resiliency on the part of the pin, wedge, clip, dog, etc., or (b) the presence of a distinct element having such a capability, is relied upon for either (1) moving the pin, etc., into or from its locking position or (2) keeping the pin, etc., from becoming separated from its operative association with one or the other of the threaded elements.

**317 With a discrete, resilient element:**

This subclass is indented under subclass 316. Device provided with a distinct element or device of a resilient nature for positioning or retaining the pin, wedge, clip, dog, etc.

**318 Comprising a spring of the coiled type:**

This subclass is indented under subclass 317. Device wherein the distinct element comprises a length of resilient wire wound in the path of a helix or spiral.

**319 And including a plastically deformable portion:**

This subclass is indented under subclass 315. Device wherein the pin, wedge, clip, dog, etc., has at least one region which, when bent or otherwise reshaped, is adapted to remain in its changed configuration (i.e., the elastic limit of the material from which the pin, etc., is formed has been exceeded).

- (1) Note. The reshaping may relate to the retaining of the member in its operative position, rather than to the member's function of restricting rotation.

**320 Comprising an elongated element divided longitudinally (e.g., a cotter pin):**

This subclass is indented under subclass 319. Device wherein the element is in the nature of a pin and is split along its longitudinal axis through a substantial portion of its length.

**321 With an elongated member in the nature of a rotation preventing key disposed axially of the threaded elements:**

This subclass is indented under subclass 190. Device provided with one or more distinct members having a rotation restricting capability and at least one of them ordinarily comprising a dowel, pin, rod, etc., which dowel, etc., is positioned generally parallel to the longitudinal axis of the threaded elements and is usually received in part in each of them, thus tending to form a positive interlock therebetween.

- (1) Note. In a few instances, the member includes a portion which is adapted to extend into a transverse opening provided in the externally threaded element.

SEE OR SEARCH THIS CLASS, SUBCLASS:

216+, for a threaded bolt and nut and means for coupling them against rotation relative to one another and wherein the means includes a discrete, rotation restricting member which confronts an axially outwardly facing portion of the nut and further wherein the member includes, as a substantial part thereof, an elongated, axially disposed portion in the nature of a key.

292+, for a member which may closely resemble the member of this subclass (321) as to appearance or orientation, but which member is an element of a thread lock.

**322 And utilizing a resilient characteristic of the key, or of a discrete element:**

This subclass is indented under subclass 321. Device wherein either (a) an inherent property of resiliency on the part of the dowel, pin, rod, etc., or (b) the presence of a distinct element having such a capability, is relied upon for either (1) moving the dowel, etc., into or from its locking position or (2) keeping the dowel, etc., from becoming separated from its operative association with one or the other of the threaded elements.

**323 And including a plastically deformable portion:**

This subclass is indented under subclass 321. Device wherein the dowel, pin, rod, etc., has at least one region which, when bent or otherwise reshaped, is adapted to remain in its changed configuration (i.e., the elastic limit of the material from which the dowel, etc., is formed has been exceeded).

- (1) Note. The reshaping may relate to the retaining of the member in its operative position, rather than to the member's function of restricting rotation.

**324 Elastic gripping action:**

This subclass is indented under subclass 190. Device wherein at least one of the threaded elements, in a region apart from its threads, is composed of or otherwise includes elastomeric material or other resilient means for frictionally holding onto a region other than the threads of the other threaded element.

SEE OR SEARCH THIS CLASS, SUBCLASS:

301+, for a threaded bolt and nut and means for coupling them against rotation relative to one another and wherein the means comprises a thread lock and further wherein one of the threaded elements, or a member in combination therewith, includes elastomeric material for frictionally gripping a threaded region.

**325 Externally threaded element includes an axially extending opening in its free end for receiving an expander member:**

This subclass is indented under subclass 190. Device wherein the externally threaded element includes, in that end which is opposite its headed end, a longitudinal bore, cavity, slot, etc., into which a distinct member of nonuniform thickness (e.g., a cone, wedge, etc.) is moved for forcing a portion of that element generally radially outwardly, the internally threaded element being so located on the externally threaded element that the radial movement does not take place in the region of their threaded interengagement.

(1) Note. See (1) Note of subclass 271 above.

(2) Note. See (2) Note of subclass 271 above.

SEE OR SEARCH THIS CLASS, SUBCLASS:

271, for a structurally similar opening and member, but wherein the expansion of the externally threaded element takes place in the region of its threaded interengagement with the other element.

**326 Pawl and ratchet:**

This subclass is indented under subclass 190. Device wherein the threaded elements are locked together by structure comprising a protuberance on one of the elements, or on an additional member, cooperating with a series of cam surfaces and stop shoulders on the other element, or on the member, whereby relative rotation of the elements is permitted in the tightening direction but prevented or restricted in the loosening direction.

**327 Pawl carried by the internally threaded element:**

This subclass is indented under subclass 326. Device wherein the pawl is positioned on the internally threaded element and rotates therewith to interlock with ratchet teeth on the externally threaded element.

**328 Pivoted pawl:**

This subclass is indented under subclass 327. Device wherein the pawl is mounted on the internally threaded element for rotation about a defined axis.

**329 Resilient pawl:**

This subclass is indented under subclass 327. Device wherein the pawl is either inherently springlike or is under the influence of an additional member in the nature of a spring.

**330 Washer carried pawl:**

This subclass is indented under subclass 326. Device wherein a substantially annular disc is provided having a central opening for receiving the externally threaded element and wherein the pawl is carried by the disc.

**331 Resilient:**

This subclass is indented under subclass 330. Device wherein the pawl is either inherently springlike or is under the influence of an additional member in the nature of a spring.

**332 Including teeth of the ramp and buttress type on the axially inwardly facing portion of the internally threaded element:**

This subclass is indented under subclass 190. Device wherein the means for limiting or preventing the turning of one threaded element with respect to the other threaded element includes, on the axially inwardly facing portion (e.g., surface) of the internally threaded element, a plurality of projections of the kind which, in profile, display a gradual slope leading to the outermost region of the projection followed by a sharp (e.g., a perpendicular) drop to a base line.

SEE OR SEARCH THIS CLASS, SUBCLASS:

227+, 240, and 326+, for rotation restricting means which include a ratchet, and with the further observation that a ratchet frequently has teeth which are of the ramp and buttress type.

**333 By deformation of a threaded element:**

This subclass is indented under subclass 190. Device wherein the means comprises the altering of the initial condition of one of the elements.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

242, 271, 276+, 305+, 309+, and 325, for other instances of deformation or distortion of a threaded element or the thread thereon.

**334 Plastic deformation:**

This subclass is indented under subclass 333. Device wherein the threaded element is deformed beyond its elastic limit.

**335 Of an internally threaded element:**

This subclass is indented under subclass 334. Device wherein the threaded element is one which is threaded internally.

**336 Into an interruption in the thread of the externally threaded element associated therewith:**

This subclass is indented under subclass 335. Device wherein the deformation of the internally threaded element causes at least one portion of it to move into at least one recess within the threaded length of its complementary externally threaded element, which recess is the product of a discontinuance of the thread of that element.

**337 HEADED FASTENER ELEMENT WITH NUT, WASHER, SECURING MEANS OR CAP:**

This subclass is indented under the class definition. Subject matter drawn to an elongated fastening means provided at one end with an enlargement or related structure in the nature of a head defining a head and further provided with either a cooperating internally threaded means, a perforated disk or annular means, a securing means in the form of an unthreaded means designed to cooperate with and restrain the fastening means, or means for covering an end of the fastening means.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

81+, for a threaded fastener (i.e., a bolt or nut) and means for restricting the rotation thereof relative to a coacting substructure.

190+, for a threaded bolt and nut and means for coupling them against rotation relative to one another.

531, for the search notes therein pertaining to other loci for washers.

SEE OR SEARCH CLASS:

24, Buckles, Buttons, Clasps, etc., subclasses 305+ for combined fasteners all of which are of the Class 24 type.

52, Static Structures (e.g., Buildings), subclasses 698+ for headed fasteners with in situ static structure assemblies. See the Search Class reference to Class 411 of Class 52 for the line between Class 411 and that Class 52 subclasses.

238, Railways: Surface Track, subclasses 251+ and 310+ for various types of headed fasteners specially adapted with or for joining railway elements.

248, Supports, subclass 239 for projecting pin shelf or scaffold bracket.

278, Land Vehicles: Animal Draft Appliances, subclasses 60+ for headed fasteners specially adapted for use with animal draft land vehicles; and subclasses 96+ for whiffletree link or clevis connectors.

301, Land Vehicles: Wheels and Axles, subclasses 9.1+ for detachable wheel connections.

**338 Lap bolt or fastener:**

This subclass is indented under subclass 337. Subject matter wherein the fastening means contains a longitudinal cavity adapted to cooperate with and telescopically receive a securing means.

**339 Interference fit type:**

This subclass is indented under subclass 338. Subject matter where the fastening means and securing means are secured by the close tolerance fit between their mating surfaces.

**340 Securing means pivotable about axis transverse to fastener axis, e.g., toggle bolt, etc.:**

This subclass is indented under subclass 337. Subject matter wherein the headed fastening means is provided with an unthreaded cooperating restraining means capable of rotating about an axis which is at a right angle to the longitudinal axis of the fastener.

## SEE OR SEARCH CLASS:

402, Binder Device Releasably Engaging Aperture or Notch of Sheet, subclasses 60+ for a device of that class which may include an elongated fastener with a pivoted end lock.

**341 And biasing spring:**

This subclass is indented under subclass 340. Subject matter further provided with an elastic structure tending to return to its normal shape after being distorted.

**342 Spring engaging securing means:**

This subclass is indented under subclass 341. Subject matter wherein the elastic structure physically contacts the unthreaded means.

**343 Spring at opposite end from securing means:**

This subclass is indented under subclass 341. Subject matter wherein the securing means is generally located on one end of the elongated fastening means and the elastic means is located on the opposite end of the fastening means.

**344 And discrete manual actuating means:**

This subclass is indented under subclass 340. Subject matter further provided with means requiring manual intervention and causing the securing means to move from one position to another.

**345 And pivoted retention means:**

This subclass is indented under subclass 340. Subject matter further provided with means for holding the securing means in its pivoted position.

**346 Channel shaped securing means:**

This subclass is indented under subclass 340. Subject matter wherein the securing means comprises an elongated element of substantially U-shaped transverse cross section.

**347 Securing means having biasing spring:**

This subclass is indented under subclass 337. Subject matter further provided with an elastic structure tending to return to its normal shape after being distorted.

**348****Ball detent securing means:**

This subclass is indented under subclass 347. Subject matter wherein the securing means is in the form of a metallic sphere.

## SEE OR SEARCH CLASS:

24, Buckles, Buttons, Clasps, etc., subclasses 211+ for a ball-detent type fastener combined with a socket to receive the fastener.

29, Metal Working, subclasses 271+ for hand manipulatable tools used to align or center pipes or similar structures.

**349****Securing means pivotable about axis of fastener:**

This subclass is indented under subclass 347. Subject matter wherein the securing means is capable of rotating about the longitudinal axis of the headed elongated fastening means.

## SEE OR SEARCH CLASS:

24, Buckles, Buttons, Clasps, etc., subclasses 221+ for mating head and socket separable fasteners wherein the head is rotatable.

**350****Securing means rotatable and axially movable, e.g., wear take-up means, etc.:**

This subclass is indented under subclass 349. Subject matter wherein the securing means can rotate through one full revolution and further wherein means are provided for moving the securing means along the fastening means axis.

**351****With draw bar or draft key fastener:**

This subclass is indented under subclass 337. Subject matter wherein the fastening means consists of an elongated bar having a substantially rectangular cross section and structured for particular use in securing locomotive couplings.

## SEE OR SEARCH CLASS:

213, Railway Draft Appliances, subclass 62 for cushioned drawbar and cushioned yoked drawbar connections.

**352****Metallic resilient securing means:**

This subclass is indented under subclass 337. Subject matter wherein the securing means is composed of a springy metal material such that the fastening means is at least in part retained

in its securing position by the resilient nature of the material.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

372, for a headed fastener element provided with a washer or cap wherein a separate means is used to attach or retain the washer or cap to the fastener element.

516+, for a resilient metallic sheet or wire formed securing means, per se.

SEE OR SEARCH CLASS:

24, Buckles, Buttons, Clasps, etc., subclasses 213+ for resilient mating head and socket separable fasteners.

37, Excavating, subclass 457 and 458+ for resilient connections between scoop buckets and teeth.

74, Machine Element or Mechanism, subclass 470 for resilient connections in control lever and linkage systems; and subclasses 500.5+ for resilient connections in hand operated flexible control systems.

248, Supports, subclass 74 for resilient ring, or clamp pipe, or cable supports.

### 353 Retainer ring:

This subclass is indented under subclass 352. Subject matter wherein the securing means is in the form of a circular band of metal.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

517+, for retainer rings, per se.

### 354 Wedge-securing means:

This subclass is indented under subclass 337. Subject matter wherein the securing means comprise a tapered block structure.

### 355 And apertured bolt:

This subclass is indented under subclass 354. Subject matter wherein the fastening means is provided with a transverse slot designed to receive the wedge-type securing means.

### 356 Penetrating pin securing means:

This subclass is indented under subclass 337. Subject matter wherein the securing means is in the form of an elongated pinlike element which is driven through an aperture or a recess

into the material in which the fastening means is used to secure the fastening means within said material.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

439+, for impact driven fastener, per se.

### 357 Longitudinally inserted:

This subclass is indented under subclass 356. Subject matter wherein the pinlike element is disposed in a generally axial direction of the fastening means.

### 358 Outwardly deflected:

This subclass is indented under subclass 357. Subject matter wherein means are provided for causing the pinlike element to be directed away from the fastening means and into the material in which the fastening means is used.

### 359 Bifurcated:

This subclass is indented under subclass 358. Subject matter wherein an end of the pinlike element is formed with a longitudinal slot which permits element portions on either side of the slot to be deflected in opposite directions.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

457+, for multiple prong impact driven fasteners.

### 360 Deformable securing means:

This subclass is indented under subclass 337. Subject matter wherein the securing means is designed for and capable of being plastically flowable.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

447+, for impact driven fasteners provided with deformable integral locking means.

501+, for plastically flowable or deflectable headed fastener elements.

### 361 Swageable collar:

This subclass is indented under subclass 360. Subject matter wherein the deformable securing means comprises an annular metal structure.

**362     Securing means deflecting a portion of fastener end:**

This subclass is indented under subclass 360. Subject matter wherein the securing means directly causes a portion of the end of the headed fastening means to radially deform.

**363     Plural end legs:**

This subclass is indented under subclass 362. Subject matter wherein the end of the fastening means has plural deflectable end structures.

**364     Cotter pin fastener:**

This subclass is indented under subclass 363. Subject matter wherein the fastening means consists of wire structure having semicircular cross section having two legs and further wherein the means outwardly deflects the legs.

SEE OR SEARCH THIS CLASS, SUBCLASS:

513+, for cotter pins fastener elements, per se.

**365     Circular deflector:**

This subclass is indented under subclass 363. Subject matter wherein the securing means is round in shape.

**366.1     Headed bolt or screw with threads and complementary nut:**

This subclass is indented under subclass 337. Subject matter wherein the headed fastener with nut wherein below the enlargement structure is provided an attached rod having externally projecting helical ribs and further provided with a separate, cooperatively mating, internally projecting, helical-ribbed perforated block.

SEE OR SEARCH THIS CLASS, SUBCLASS:

81+, for a threaded fastener (i.e., a bolt or nut) and means for restricting the rotation thereof relative to a structure.

190+, for a threaded bolt and nut and means for coupling them against rotation relative to one another.

378+, for externally threaded fastener elements.

427+, for internally threaded fastener elements.

SEE OR SEARCH CLASS:

24, Buckles, Buttons, Clasps, etc., subclasses 90.1+ for screw threaded buttons.

**366.2     Flush mount or low profile:**

This subclass is indented under subclass 366.1. Subject matter wherein the headed fastener with nut in which the enlargement structure and the perforated block are designed to be even with or slightly extending beyond the external surfaces of opposed members (e.g., two flat panels) to be joined.

**366.3     Threads having a specific pitch or angle:**

This subclass is indented under subclass 366.1. Subject matter wherein the headed fastener with nut in which the externally projecting helical ribs are positioned at a specific slant or geometric degrees from a reference line.

**367     Having stay bolt spacer sleeve type:**

This subclass is indented under subclass 81. Subject matter wherein the fastening means is structured for and used in securing two or more plates or similar members in spaced relationship and further wherein the washer is in the form of a metallic cylindrical member which when in its assembled relationship substantially encloses the stay bolt while lying intermediate the plates or similar members.

(1) Note. The fastener assemblage of this subclass is typically used to secure boiler plates.

SEE OR SEARCH THIS CLASS, SUBCLASS:

370, for a stay bolt with a bearing washer.  
379+, for threaded stay bolt structure, per se.  
505, for unthreaded stay bolt structure.

SEE OR SEARCH CLASS:

122, Liquid Heaters and Vaporizers, subclass 496 for combinations of stay bolts and stay bolt structures with boiler structures.

**368     Having washer:**

This subclass is indented under subclass 366.1. Subject matter further provided with a perforated disk.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
531+, for washers, per se.
- 369 Including sealing means:**  
This subclass is indented under subclass 368. Subject matter wherein either the internally threaded means or disk is provided with means or structure which cooperate to prevent the ingress of fluid between the internally threaded means or disk and the fastening means.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
542, for sealing washers, per se.
- SEE OR SEARCH CLASS:  
277, Seal for a Joint or Juncture, for a generic sealing means or process, subclass 640 for a static contact seal for other than an internal combustion engine, or a pipe, conduit, or cable including an anchoring means extending through the seal.  
292, Closure Fasteners, subclass 307 for closure seal structure.
- 370 Stay bolt bearing washer:**  
This subclass is indented under subclass 369. Subject matter wherein the fastening means is structured for and used in securing two or more plates or similar members in a spaced relationship and further wherein the washer is structured for and used to mount the head of the fastener element within or to a plate or similar member.
- (1) Note. The fastener assemblage of this subclass is typically used to secured boiler plates.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
379+, for threaded stay bolt structure.  
505, for an unthreaded stay bolt structure.
- SEE OR SEARCH CLASS:  
122, Liquid Heaters and Vaporizers, subclass 496 for combination of stay bolts with boiler structures.
- 371.1 Sealing-type washer compressed by head:**  
This subclass is indented under subclass 337. Subject matter wherein the washer in which the perforated disk is designed to exclude liquid or gas.
- 371.2 Washer adjacent head and having a particular shape (e.g., dished) or composition:**  
This subclass is indented under subclass 337. Subject matter wherein the headed fastener wherein the fastening means is provided with a perforated disk which has a unique geometry or makeup.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
429+, for an internally threaded fastener element provided with a cap.  
531+, for washer structure.
- 372.5 Cap over the head:**  
This subclass is indented under subclass 337. Subject matter wherein the headed fastener wherein the enlargement structure is provided with a means for covering.
- 372.6 Having attaching or retaining means:**  
This subclass is indented under subclass 372.5. Subject matter wherein the cap over the head in which the covering is fastened to other structure.
- 372 And separate attaching or retaining means:**  
This subclass is indented under subclass 371. Subject matter provided with separate distinct means to join or maintain the washer or cap with the fastening means.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
533, for a washer provided with means capable of retaining the washer to a fastener.
- 373 Attached cap structure:**  
This subclass is indented under subclass 371. Subject matter drawn to the configuration of the means for covering an end of the fastening means.



SEE OR SEARCH THIS CLASS, SUB-CLASS:

429+, for internally threaded fastener element having a cap.

**374 By screw means:**

This subclass is indented under subclass 373. Subject matter wherein the means for covering is attached by helical thread structure.

**375 By crimping:**

This subclass is indented under subclass 373. Subject matter wherein attachment is produced by plastic deformation of a portion of the cap.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

430, for an internally threaded fastener element having a cap crimped thereto.

**376 By welding:**

This subclass is indented under subclass 373. Subject matter wherein attachment is produced by metallic fusion bonding.

**377 Formed by molding:**

This subclass is indented under subclass 373. Subject matter wherein the end covering means is produced and attached to the headed fastener by use of shapable material.

**378 EXTERNALLY THREADED FASTENER ELEMENT, E.G., BOLT, SCREW, ETC.:**

This subclass is indented under the class definition. Subject matter drawn to an elongated fastening means provided with an exterior helical ridge.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

168, for an externally threaded fastener driven into a substructure (i.e., a workpiece) and means consisting of, or including, a thread lock for restricting the rotation of the fastener relative to the substructure.

SEE OR SEARCH CLASS:

285, Pipe Joints or Couplings, subclass 191 for end to side or plate bolt joint.

470, Threaded, Headed Fastener, or Washer Making: Process and Apparatus, subclasses 8+ for processes of making externally threaded fastener elements (e.g., screws, bolts, etc.).

**379 Stay bolt:**

This subclass is indented under subclass 378. Subject matter wherein the fastening means comprises an elongated structure designed to have one end attached to a plate or wall structure with the opposite end attached to and reinforcing a second plate or wall structure.

(1) Note. The bolts of this subclass are generally used to reenforce sheets in boiler structures.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

505, for an unthreaded stay bolt which has a plastically flowed or deflectable end.

SEE OR SEARCH CLASS:

122, Liquid Heaters and Vaporizers, subclass 496 for combinations of stay bolts with boiler structure.

**380 Having spherical head:**

This subclass is indented under subclass 379. Subject matter wherein one end is shaped in the form of a globe.

**381 And telltale bore:**

This subclass is indented under subclass 380. Subject matter wherein the fastening means is provided with a longitudinal extending cavity.

(1) Note. Telltale bores are provided to facilitate visual observation of a rupture in a stay bolt.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

382, for a threaded stay bolt without a spherical head but having a telltale bore.

**382 Having telltale bore:**

This subclass is indented under subclass 379. Subject matter wherein the fastening means is provided with a longitudinal extending cavity.

- 383 Multipart:**  
This subclass is indented under subclass 378. Subject matter wherein the fastening means is composed of a plurality of discrete sections wherein each section integrally includes a portion of a head and a shank or thread structure.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
469, for multipart impact driven plural prong fasteners.
- 384 Axially adjustable:**  
This subclass is indented under subclass 383. Subject matter wherein the sections include means cooperating therebetween to permit the longitudinal dimension of the fastening means element to be varied.
- 385 Comprising longitudinal side-by-side sections:**  
This subclass is indented under subclass 383. Subject matter wherein the discrete sections comprise elongated elements which when mated in lateral side-by-side relationship form the fastening means.
- 386 Pilot end having means enhancing fastening or installation:**  
This subclass is indented under subclass 378. Subject matter wherein the fastening means is provided with means either for penetrating the material, substructure or other work to be fastened or allowing the fastening means to be torqued at an insertion end.
- 387.1 Drill-tip-type end:**  
This subclass is indented under subclass 386. Subject matter wherein the pilot end wherein the penetrating or torqued portion includes means for boring a hole.
- SEE OR SEARCH CLASS:  
408, Cutting by Use of Rotating Axially Moving Tool, subclasses 199+ for drill bits.
- 387.2 Having a reaming portion:**  
This subclass is indented under subclass 387.1. Subject matter wherein the drill tip which includes a portion for enlarging the bored hole, usually to easily insert the fastener.
- 387.3 Having enhanced gripping structure:**  
This subclass is indented under subclass 387.1. Subject matter wherein the drill tip which includes a portion (e.g., a barb) for better securement.
- 387.4 Thread-tapping portion or with thread pitch stabilizing ridge:**  
This subclass is indented under subclass 387.1. Subject matter wherein the device wherein the tool or tool-support includes a body portion having (a) a crest formed in the peripheral surface thereof, said crest extending along a spiral path deflected along the tool-axis, and serving to engage the work and thereby guide the tool during cutting or (b) cutting teeth etching a helical groove.
- SEE OR SEARCH CLASS:  
408, Cutting by Use of Rotating Axially Moving Tool, subclasses 215+ for pitch-stabilizing ridge.
- 387.5 Having distinct, spaced cutting edges or points (e.g., prongs):**  
This subclass is indented under subclass 387.1. Subject matter wherein the specific drill tip in which a plurality of cutting-edges disposed about the tool-axis are separated, one from the other, when viewed in a direction parallel to the tool-axis.
- SEE OR SEARCH CLASS:  
408, Cutting by Use of Rotating Axially Moving Tool, subclasses 211+ for inversely angled cutting edge and subclasses 227+ for tool having peripherally spaced cutting edges.
- 387.6 Resembling a twist-drill-type bit tip:**  
This subclass is indented under subclass 387.1. Subject matter wherein the specific drill tip wherein the boring means looks exactly like a rod-like member having a work engaging point or chisel portion adjacent a fluted section, relief surface, or deep helical grooves.
- 387.7 Cuttings or chips moved along curved relief channel:**  
This subclass is indented under subclass 387.6. Subject matter wherein the device wherein the void area is of axial dimension and of circum-

ferential dimension so that it extends helically along the tool-axis.

SEE OR SEARCH CLASS:

408, Cutting by Use of Rotating Axially Moving Tool, subclass 230 for a tool having peripherally spaced cutting edges with axially extending spiral relief channel.

**387.8 And specified cutting edge, face, rake, relief surface, or flute angle (e.g., axially facing facets):**

This subclass is indented under subclass 387.6. Subject matter in which the bit tip has a unique geometry.

SEE OR SEARCH CLASS:

408, Cutting by Use of Rotating Axially Moving Tool, subclass 228 for tool having peripherally spaced cutting edges.

**388 Double-ended:**

This subclass is indented under subclass 378. Subject matter wherein the fastening means is provided with two distinct end configurations one of which is threaded.

- (1) Note. The fastener elements of this subclass usually have a boss or similar driving structure between the end configurations.

SEE OR SEARCH THIS CLASS, SUBCLASS:

479, for impact driven hollow or dowel type fasteners.

**389 Both ends threaded:**

This subclass is indented under subclass 388. Subject matter wherein each end configuration of the fastening means is provided with a helical ridge.

**390 Single element having means facilitating or effecting separation:**

This subclass is indented under subclass 378. Subject matter wherein an initially single piece fastening means includes means or structure allowing or producing its separation into plural segments.

**391 By fluent pressure:**

This subclass is indented under subclass 390. Subject matter wherein the means allowing or producing separation is adapted to operate by the application of a pressurized fluid or flowable substance.

**392 Resiliently flexible:**

This subclass is indented under subclass 378. Subject matter wherein the fastening means is partially or entirely formed of a material which permits the bolt to be elastically deformed radially of the fastening means axis.

**393 Set screw:**

This subclass is indented under subclass 378. Subject matter wherein the fastening means is provided with a thread throughout its length and with a cavity in one end adapted to receive a driving tool.

**394 Drive screw:**

This subclass is indented under subclass 378. Subject matter wherein the fastening means is provided with a thread of a pitch or shape that allows the fastening means to be impact driven into the material, substructure or other work to be fastened.

- (1) Note. The thread of the fastener element allows it to be withdrawn by rotation.

**395 Having bore therethrough:**

This subclass is indented under subclass 378. Subject matter provided with a longitudinal extending cavity.

- (1) Note. The bore is generally provided to allow for lubricating material to be passed from one area to another.

**396 Separate head element:**

This subclass is indented under subclass 378. Subject matter wherein the fastening means is provided with a transverse projection or head and further wherein the head and the remainder of the fastener means are separately formed and the head is subsequently attached to the remainder of the fastener means.

**397 Threadedly attached to shank:**

This subclass is indented under subclass 396. Subject matter wherein the attachment is by mating exterior and interior helical ridge structure.

**398 Head eccentric with respect to fastener axis:**

This subclass is indented under subclass 378. Subject matter wherein the fastening means is provided with a transverse projection, i.e., a head and further wherein the head is radially offset from the longitudinal axis of the fastening means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

169, for a bolt which has the center of mass of its head offset from the longitudinal axis of its shank.

**399 Head having counter-sinking means:**

This subclass is indented under subclass 378. Subject matter wherein the fastening means has a transverse projection, i.e., a head and further wherein the head includes means adapted to cut away the material into which the fastening means is driven so that the head may be sunk flush with or below the surface of the material.

**400 Hook head, e.g., J-bolt, etc.:**

This subclass is indented under subclass 378. Subject matter wherein the fastening means is provided with a head defining an arcuately formed extension on its shank.

SEE OR SEARCH THIS CLASS, SUBCLASS:

485, for a hook head impact driven fastener.

**401 Elongated head, e.g., hanger bolt, etc.:**

This subclass is indented under subclass 378. Subject matter wherein the fastening means is provided with a head comprising a generally elongated portion extending transversely of the shank and being adapted to having a smaller dimension of its elongated portion received through a slot in an undercut portion of the slot upon rotating the bolt substantially  $90^\circ < /$ .

SEE OR SEARCH CLASS:

248, Supports, subclass 59 for pipe or cable supports vertically adjustable.

**402 Head driving structure:**

This subclass is indented under subclass 378. Subject matter wherein the fastening means is provided with a transverse projection, i.e., a head, which is further provided with head driving structure adapted to receive an impelling tool used to secure the fastening means and further wherein significance is attributed to the means to receive the tool.

**403 Socket or slot:**

This subclass is indented under subclass 402. Subject matter wherein the head driving structure consists of a peripherally closed cavity or a groove.

SEE OR SEARCH CLASS:

81, Tools, subclasses 436+ for wrenches designed for insertion into a cavity, e.g., a slot, or socket, etc.

**404 Orthogonally arranged slots, e.g., phillips head, etc.:**

This subclass is indented under subclass 403. Subject matter provided with a plurality of slots, two of which intersect at a right angle.

SEE OR SEARCH CLASS:

81, Tools, subclass 460 for wrenches having plural, noncollinear blades designed for insertion into a cavity.

**405 Opposed open ended plural slots, e.g., spanner, etc.:**

This subclass is indented under subclass 403. Subject matter provided with a plurality of slots, two of which lie on opposite edges of the perimeter of the head driving structure.

SEE OR SEARCH CLASS:

81, Tools, subclasses 442+ for wrenches having relatively movable components insertable into a cavity.

**406 Dovetail:**

This subclass is indented under subclass 403. Subject matter wherein the cavity or groove is in the form of a fan-shaped mortise adapted to interlock with a mating tenon tool.

(1) Note. The tenon tool end interlocks with the bolt head by sliding transversely to the fastener axis into the mortise.

**407 Having driver retaining means:**

This subclass is indented under subclass 403. Subject matter wherein the cavity or groove includes means for preventing inadvertent longitudinal movement of the tool.

SEE OR SEARCH CLASS:

81, Tools, subclass 459 for wrenches provided with driver retaining means in the form of a threaded periphery.

**408 Frictional engagement:**

This subclass is indented under subclass 402. Subject matter wherein the head driving structure consists purely of frictional resistance between mating surfaces of the head and impelling tool.

**409 Wing structure:**

This subclass is indented under subclass 402. Subject matter wherein the head is provided with a radially extending generally flat gripping section.

(1) Note. The heads of this subclass usually have two gripping sections which are generally designed to be engaged by the fingers of the user.

**410 Plural diverse driving structures:**

This subclass is indented under subclass 402. Subject matter provided with a plurality of discrete different means adopted to engage with different driving tools.

SEE OR SEARCH CLASS:

81, Tools, subclass 461 for wrenches provided with plural, separate, projections designed to be inserted into a cavity, e.g., a socket, or slot, etc.

**411 Thread or shank structure:**

This subclass is indented under subclass 378. Subject matter wherein significance is attributed to either that portion of the fastening means between a head and the helical ridge, i.e., the shank or the helical ridge.

**412 Plural threads on single shank:**

This subclass is indented under subclass 411. Subject matter wherein the helical ridge comprises plural distinct helical ridge means concentrically arranged on the shank of the

fastening means with each of the helical ridge means lying between the adjacent convolutions of one or more of other of said helical ridge means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

245, for a threaded bolt and nut and means for coupling them against rotation relative to one another and wherein the means includes a discrete, rotation restricting member which confronts an axially outwardly facing portion of the nut and further wherein the member is in the nature of another nut and additionally wherein means, associated with one or both nuts, is included for restricting the rotation of one of the nuts relative to the other and lastly wherein (a) the thread of one of the nuts is of a different hand than that of the other and (b) the bolt includes threaded portions mating with the threaded portion of each of the nuts.

**413 Of different pitch:**

This subclass is indented under subclass 412. Subject matter wherein the pitch of one of the helical ridges differs from that of another of the helical ridges over at least a portion of its length.

(1) Note. Pitch is defined as the distance between the crests of two adjacent thread or helical ridge convolutions.

**414 Buttress thread:**

This subclass is indented under subclass 411. Subject matter wherein the cross section of the ridge comprises a gradual leading flank and an abrupt trailing flank which intersect to define a relatively pointed ridge crest.

**415 Of varying thread pitch:**

This subclass is indented under subclass 411. Subject matter wherein the pitch of the ridge is not uniform throughout the length of the ridge.

(1) Note. The variation in pitch may constitute a variance of any type over any portion of the thread.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
 307, for a threaded bolt and nut and means for coupling them against rotation relative to one another and wherein the means comprises a thread lock and further wherein the locking results from the use of (a) a thread of one pitch on the bolt (or nut) and thread of a different pitch on the nut (or bolt) or (b) a thread on either the bolt or the nut which has a particular pitch in one increment of its length and a different pitch in another increment thereof.
- 416 Lobular thread:**  
 This subclass is indented under subclass 411. Subject matter wherein the major diameter of the ridge varies along the circumference of the ridge.
- (1) Note. The major diameter consists of that distance from crest taken along a line transverse to the fastener axis. The variation of the major diameter will generally consist of alternating high and low points in the thread cross section.
- 417 Circumferentially interrupted thread:**  
 This subclass is indented under subclass 411. Subject matter wherein the helical ridge has a discontinuity of at least a portion of a depth of a ridge section with the ridge on either side circumferentially thereof being of full depth.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
 221+, and 271+, for a threaded bolt and nut means for coupling them against rotation relative to one another and wherein the means includes an axially extending recess in the externally threaded element.
- 437, for an internally threaded fastener element having interrupted thread structure.
- 418 By longitudinal slot:**  
 This subclass is indented under subclass 417. Subject matter wherein the discontinuity which causes the ridge interruption comprises a relatively narrow groove extending axially of the fastening means.
- 419 Shank bifurcated by slot extending entirely therethrough:**  
 This subclass is indented under subclass 418. Subject matter wherein the groove passes transversely through and divides a shank of the fastening means into laterally spaced sections.
- 420 Inclined slot:**  
 This subclass is indented under subclass 418. Subject matter wherein the groove is at an angle to the fastening means axis.
- 421 Helically oriented:**  
 This subclass is indented under subclass 420. Subject matter wherein the groove slot traces a spiral path about the fastening means.
- 422 By peripherally closed transversely extending aperture:**  
 This subclass is indented under subclass 417. Subject matter wherein the ridge discontinuity comprises a peripherally closed cavity having an axis transverse to the fastening means axis.
- 423 Truncated thread:**  
 This subclass is indented under subclass 411. Subject matter wherein the crest of the ridge has its apex cut, or removed, and replaced by a planar surface.
- (1) Note. The planar surface is usually parallel to the fastener axis.
- 424 Shank structure:**  
 This subclass is indented under subclass 411. Subject matter wherein significance is attributed to that portion of the fastening means between a head and the helical ridge, i.e., a shank.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
 487+, for shank structure of impact driven fastener.
- 425 Twisted:**  
 This subclass is indented under subclass 424. Subject matter wherein the shank is formed by subjecting it to torsional plastic deformation.

**426 Tapered:**

This subclass is indented under subclass 424. Subject matter wherein the shank defines a conical surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:

489, for impact driven fasteners having significant tapered shank structure.

**427 INTERNALLY THREADED FASTENER ELEMENT, E.G., NUT, ETC.:**

This subclass is indented under the class definition. Subject matter drawn to a fastening means provided with an internal helical ridge.

SEE OR SEARCH THIS CLASS, SUBCLASS:

527, for resilient sheet metal fastener securing elements having helically inclined tongues, e.g., speed nuts, etc., which act as an internally threaded fastener but wherein the ridge does not trace a complete helix.

SEE OR SEARCH CLASS:

138, Pipes and Tubular Conduits, subclass 96 for internally threaded pipe and tube end protectors.

285, Pipe Joints or Couplings, subclasses 386+ for a coupling comprising a screw thimble holding means; and subclasses 390+ for internally threaded sleeves.

470, Threaded, Headed Fastener, or Washer Making: Process and Apparatus, subclasses 18+ for process of making internally threaded fastener elements (e.g., nuts, etc.).

**428 Including lubricating means:**

This subclass is indented under subclass 427. Subject matter provided with means having or supplying fluid for reducing friction between mating threads of the internally threaded fastener element and an externally threaded fastener element.

SEE OR SEARCH CLASS:

384, Bearings, subclasses 286+ for lubricating sleeves, or liners.

**429 Having cap:**

This subclass is indented under subclass 427. Subject matter provided with means enclosing one end of the fastener element.

(1) Note. The enclosing means or cap, usually an ornamental element, may comprise a separate member attached to the fastener element or may be a unitary part of the fastener element.

**430 Cap crimped onto nut:**

This subclass is indented under subclass 429. Subject matter wherein attachment of the enclosing means is by the alteration of shape of the enclosing means onto the fastener element.

**431 Resiliently retained:**

This subclass is indented under subclass 429. Subject matter wherein the enclosing means or fastener element is structured to, or is composed of, or provided with means of elastic material tending to return to its normal shape when distorted thereby securing the enclosing means and fastener element.

**432 Multipart:**

This subclass is indented under subclass 427. Subject matter wherein the fastener means comprises a plurality of discrete sections.

**433 Including movable threaded segments:**

This subclass is indented under subclass 432. Subject matter wherein the fastener means is adapted to be readily separated into its plural sections.

**434 Moved by fluent pressure:**

This subclass is indented under subclass 433. Subject matter wherein the fastener means is further adapted to separate by the use of a pressurized fluid or flowable substance.

**435 Wing:**

This subclass is indented under subclass 427. Subject matter provided with driving means in the form of a radially extending generally flat gripping section.

(1) Note. The wing means usually has two such sections and are generally designed to be engaged by the fingers of the user.

- 436 Thread structure:**  
This subclass is indented under subclass 427. Subject matter where significance is attributed to the helical ridge.
- 437 Interrupted:**  
This subclass is indented under subclass 436. Subject matter wherein the helical ridge has a discontinuity.
- 438 Coil spring:**  
This subclass is indented under subclass 436. Subject matter wherein the ridge is defined by the convolutions of a helical resilient element.
- SEE OR SEARCH CLASS:  
29, Metal Working, subclass 240.5 for devices which assemble wire coil thread inserts by rotation.
- 439 IMPACT DRIVEN FASTENER, E.G., NAIL, SPIKE, TACK, ETC.:**  
This subclass is indented under the class definition. Subject matter drawn to a fastener provided with an impact receiving surface adapted to receive an axially applied force which causes the fastener to penetrate material, substructure, or other work to be fastened.
- SEE OR SEARCH CLASS:  
248, Supports, subclass 71 for pipe or cable supports provided with penetrating means; and subclass 216.1 for specially mounted or attached brackets having piercing means.  
439, Electrical Connectors, subclasses 387+ for an electrical connector including a contact with a sharp, piercing or cutting edge.
- 440 Having means to facilitate explosive driving:**  
This subclass is indented under subclass 439. Subject matter provided with means specially adapted for allowing the fastener to be driven by fluent pressure resulting from an explosive charge detonation.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
532, for washer provided with explosive release means.
- 441 Discrete guide or centering means:**  
This subclass is indented under subclass 440. Subject matter wherein the specially adapted means comprises an alignment or guiding element mounted on a shank portion of the fastener wherein the element is structured to engage and cooperate with an interior surface of a bore of an explosively actuated driving tool.
- 442 Plural attached fasteners:**  
This subclass is indented under subclass 439. Subject matter wherein two or more of the fasteners are secured together.
- (1) Note. The fasteners are secured in a strip to facilitate ease of handling, storage, and to render them suitable for use in automatic driving tools.
- (2) Note. See (1) Note., of subclass 77 of Class 59, Chain, Staple, and Horseshoe Making, for the distinction between a staple blank of that locus (59/77), and a staple package of subclasses 340+ of Class 206, Special Receptacle or Package, and a staple strip of this locus (411/442).
- 443 Integral strip:**  
This subclass is indented under subclass 442. Subject matter wherein the fasteners are attached during their formation thereby producing a relatively long and continuous homogeneous fastener structure.
- 444** This subclass is indented under subclass 442. Laterally attached only at head or bridge: Subject matter wherein the fasteners are connected together at ends thereof which are adapted to receive impact during driving.
- 445 Attached end-to-end:**  
This subclass is indented under subclass 442. Subject matter wherein the fasteners are attached such that an impact receiving end of a fastener is connected to a penetrating end of an adjacent fastener.
- 446 Including integral locking means:**  
This subclass is indented under subclass 439. Subject matter wherein the fastener is provided with means unitary thereto specially adapted to



- prevent or render difficult withdrawal subsequent to driving of the fastener.
- 447 Comprising deformable portion:**  
This subclass is indented under subclass 446. Subject matter wherein the unitary means comprises a fastener portion alterable in shape.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
501+, for a headed fastener having a flowable or deflectable end (e.g., a rivet).
- 448 Expansible on impact:**  
This subclass is indented under subclass 447. Subject matter wherein the alterable portion is radially expandable in response to the axially applied force.
- (1) Note. The axially applied force will simultaneously cause radially expansion of the deformable portion while causing the fastener to penetrate the material, substructure, or other work to be fastened.
- 449 Axially collapsible section:**  
This subclass is indented under subclass 448. Subject matter wherein the alterable portion is designed to collapse upon the application of a predetermined axial force thereby producing radial expansion of adjacent portions of the fastener.
- 450 Having means engageable on underside of member being secured by fastener:**  
This subclass is indented under subclass 446. Subject matter wherein the fastener includes a portion which is adapted to be beneath a member being secured by means of a separate operation after the fastener has been driven.
- (1) Note. The separate operation, e.g., could be partial rotation of the fastener.
- 451.1 Comprising protrusion or recess on shank:**  
This subclass is indented under subclass 446. Subject matter wherein the integral locking means wherein the fastener consists of a headed structure provided with a shank and end portions and further wherein the shank is provided with either an outwardly extending structure adapted to penetrate the material into which the fastener is driven or a cavity structure specially adapted to receive penetrated displaced material.
- 451.2 Undulating type:**  
This subclass is indented under subclass 451.1. Subject matter wherein the protrusion or recess on shank which has a wavy type pattern.
- 451.3 Serrations or sharp teeth:**  
This subclass is indented under subclass 451.1. Subject matter wherein the protrusion on shank which has a series of right triangles.
- 451.4 Longitudinal flute, depression, or channel:**  
This subclass is indented under subclass 451.1. Subject matter wherein the recess on shank which includes a narrow groove.
- 451.5 Shoulder-type protrusion:**  
This subclass is indented under subclass 451.1. Subject matter wherein the protrusion on shank which includes a lateral generally flat (perpendicular to the main axis) portion extending beyond the main body of the fastener.
- 452 Longitudinal rib:**  
This subclass is indented under subclass 451.1. Subject matter wherein the outwardly extending structure comprises a narrow ridge running lengthwise of the shank.
- 453 Spiral rib:**  
This subclass is indented under subclass 452. Subject matter wherein the ridge extends in a helical path about the fastener shank.
- 454 Defined by twisted shank:**  
This subclass is indented under subclass 453. Subject matter wherein the ridge rib is formed by the shank having been subjected to torsion about its axis.
- 455 Circumferential rib:**  
This subclass is indented under subclass 451.1. Subject matter wherein the outwardly extending structure comprises a continuous narrow ridge extending about the periphery of the shank.
- 456 Barb or spur type projection:**  
This subclass is indented under subclass 451.1. Subject matter wherein the outwardly extending structure comprises an isolated protrusion having a pointed part projecting rearwardly in

- the direction of the headed structure of the fastener.
- 457 Multiple prong, e.g., nailing plate, staple, etc.:**  
This subclass is indented under subclass 439. Subject matter wherein the fastener is provided with a plurality of distinct connected penetrating ends.
- SEE OR SEARCH CLASS:  
16, Miscellaneous Hardware, subclass 16 for strip type multiple prong carpet fasteners.  
59, Chain, Staple, and Horseshoe Making, subclass 77 for staple blank structures and process of making staples. See the notes or Class 59, subclass 77 for the line between that subclass and this class (411).
- 458 Oppositely disposed prongs:**  
This subclass is indented under subclass 457. Subject matter wherein two penetrating ends are situated  $180^{\circ}$  apart.
- (1) Note. The fasteners of this and indented subclasses are intended to have a prong driven into a first workpiece and then have a second workpiece driven or forced onto another opposed prong.
- 459 Having plural prongs on one end:**  
This subclass is indented under subclass 458. Subject matter provided with two or more laterally spaced penetrating ends facing the same direction.
- 460 Having identical ends:**  
This subclass is indented under subclass 458. Subject matter wherein the penetrating ends are duplicates.
- 461 Of sheet metal:**  
This subclass is indented under subclass 457. Subject matter wherein the fastener is formed from sheet metal.
- (1) Note. The fastener is usually formed by cutting or stamping.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
477+, for single prong impact driven fasteners formed from sheet metal.  
503, for sheet metal formed plural legged headed fastener elements.
- 462 Including stiffening means:**  
This subclass is indented under subclass 461. Subject matter wherein stiffening means are provided or a portion of the fastener is shaped to increase the rigidity of the sheet metal.
- 463 Rib:**  
This subclass is indented under subclass 462. Subject matter wherein the stiffening means comprises an elongated embossment in the sheet metal defining a protruding portion on one face of the fastener and a recessed portion on the opposing face thereof.
- 464 Entire fastener having corrugations parallel to driving direction:**  
This subclass is indented under subclass 463. Subject matter wherein essentially the entire fastener surface includes elongated alternating ridges and grooves.
- 465 Having sawtooth penetrating edge:**  
This subclass is indented under subclass 464. Subject matter wherein a penetrating edge of the fastener is defined by a series of lateral sharp points disposed in parallel relationship to the alternating ridges and grooves.
- 466 Prongs cut and formed from body portion:**  
This subclass is indented under subclass 461. Subject matter further wherein the penetrating ends are severed and bent from the sheet metal.
- 467 Plural prongs from single opening:**  
This subclass is indented under subclass 466. Subject matter wherein two or more penetrating ends are punched from a single opening in the sheet.
- 468 Including opposed prongs defining mirror image of each other:**  
This subclass is indented under subclass 467. Subject matter wherein a penetrating end is struck from each of a pair of opposed ends of a single opening with the two penetrating ends being identical to each other while being ori-

- ented 180° apart with respect to the direction in which the respective identical surfaces of the penetrating end faces.
- 469 Multipart:**  
This subclass is indented under subclass 457. Subject matter wherein the fastener is made of a plurality of discrete sections.
- 470 Having prongs of different lengths:**  
This subclass is indented under subclass 457. Subject matter wherein the penetrating ends are of unequal length.
- 471 Each prong bevelled from a single side toward its opposite side:**  
This subclass is indented under subclass 457. Subject matter wherein each of the penetrating ends includes a first side surface which lies substantially in a single plane and extends to the extremity of a penetrating point and includes a second side surface opposing said first surface and having a tapered portion thereof adjacent the penetrating point being tapered inwardly in the direction of said point and terminating at the extremity thereof.
- 472 Bevel located on outside of prong:**  
This subclass is indented under subclass 471. Subject matter wherein the tapered portion of each penetrating end is located on an outer side surface of the penetrating end.
- 473 Having distinct driving head:**  
This subclass is indented under subclass 457. Subject matter wherein significance is attributed to the impact receiving surface of the fastener.
- 474 Plural heads:**  
This subclass is indented under subclass 473. Subject matter wherein the fastener is provided with more than one impact receiving surface.
- 475 Having means to limit penetration short of bridge portion:**  
This subclass is indented under subclass 457. Subject matter wherein means connecting the plural penetrating ends comprises a bridge portion and further wherein spaced from the bridge portion is a shoulder means specially adapted to maintain the bridge portion at a distance from the material into which the fastener is driven.
- 476 Having frangible portion:**  
This subclass is indented under subclass 457. Subject matter wherein the fastener includes a portion which is specially adapted to fracture during driving thereof or which fractures in order to permit removal of the fastener from the material in which it has been driven.
- 477 Of sheet metal:**  
This subclass is indented under subclass 439. Subject matter wherein the fastener is formed from sheet metal.
- (1) Note. The fastener is usually formed by cutting or stamping.
- 478 Folded or twisted:**  
This subclass is indented under subclass 477. Subject matter wherein the fastener is subjected either to bending or torsional forces.
- 479 Hollow fastener:**  
This subclass is indented under subclass 477. Subject matter wherein the sheet metal is rolled or otherwise formed into a cylindrical shape.
- 480 Separately attached head:**  
This subclass is indented under subclass 439. Subject matter wherein the impact receiving surface of the fastener is an initially discrete element which is subsequently secured to a shank portion.
- 481 Head having central recess:**  
This subclass is indented under subclass 439. Subject matter wherein the impact receiving surface includes a cavity aligned with the fastener axis.
- (1) Note. The cavity may serve a number of functions, e.g., a nail set, etc.
- 482 Plural axially aligned heads:**  
This subclass is indented under subclass 439. Subject matter wherein the impact receiving surface comprise multiple receiving surfaces attached end-to-end concentric to the fastener axis.
- 483 Wire formed head:**  
This subclass is indented under subclass 439. Subject matter wherein the impact receiving surface comprises a wire element configured to

produce a projection transverse to the fastener axis.

- (1) Note. The wire formed head is often a continuation of the shank portion of the fastener.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

543, for wire formed washers.

**484 Domed head:**

This subclass is indented under subclass 439. Subject matter wherein the impact receiving surface comprises a convexly curved surface defining substantially a segment of a sphere.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

507, for domed head fastener elements (e.g., a rivet).

**485 Hook head:**

This subclass is indented under subclass 439. Subject matter wherein the impact receiving surface includes an angularly shaped portion adapted to be grasped or to attach a member thereto.

**486 Head forms segment of disk:**

This subclass is indented under subclass 439. Subject matter wherein the impact receiving surface is configured into a portion of a circular band of material.

**487 Shank or penetrating end structure:**

This subclass is indented under subclass 439. Subject matter wherein significance is attributed to a piercing end or the shank portion between the piercing end and the impact receiving surface.

**488 Flat-sided shank:**

This subclass is indented under subclass 487. Subject matter wherein the shank is formed with a longitudinally extending planar surface.

**489 Tapered:**

This subclass is indented under subclass 488. Subject matter wherein the planar surface is inclined with respect to the longitudinal axis of the fastener.

**490 Stepped shank:**

This subclass is indented under subclass 487. Subject matter wherein the shank includes plural sections of progressively decreasing diameters in the direction of the penetrating end of the fastener with each of said sections being of substantially uniform diameter throughout its length.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

497, for impact driven fasteners having a stepped end structure.

**491 Oval or lobular shank:**

This subclass is indented under subclass 487. Subject matter wherein the shank portion is formed with a cross section defining a curved surface having maximum and minimum diameters which constitute alternating high and low points on the periphery of the cross section.

**492 Angular shank portion:**

This subclass is indented under subclass 487. Subject matter wherein the shank portion has a polygonal cross section.

**493 End structure:**

This subclass is indented under subclass 487. Subject matter wherein significance is attributed to the piercing end of the fastener.

**494 Pyramidal point:**

This subclass is indented under subclass 493. Subject matter wherein the piercing end has the shape of a polyhedron having a polygonal base and triangular faces meeting at a common point.

**495 Slotted end:**

This subclass is indented under subclass 493. Subject matter wherein the piercing end is formed with a relatively shallow transversely extending recess.

**496 Chisel point:**

This subclass is indented under subclass 493. Subject matter wherein the piercing end has the shape of a prism.

- 497 Stepped end:**  
This subclass is indented under subclass 493. Subject matter wherein the piercing end comprises a series of sections each successive one of which is of increased transverse dimension in the longitudinal direction towards the impact receiving surface.
- 498 Conical point:**  
This subclass is indented under subclass 493. Subject matter wherein the piercing end in the shape of a surface generated by revolving a right triangle about one of its sides other than the hypotenuse.
- 499 Having a curved surface:**  
This subclass is indented under subclass 493. Subject matter wherein the piercing end is in the shape of a continuous smooth arcuate three-dimensional figure boundary.
- 500 HEADED FASTENER ELEMENT:**  
This subclass is indented under the class definition. Subject matter drawn to an elongated fastening means provided at one end with an enlargement or related structure in the nature of a head.
- SEE OR SEARCH CLASS:  
248, Supports, subclass 239 for projecting pin shelf or scaffold bracket.
- 501 Having plastically flowable or deflectable end, e.g., rivet, etc.:**  
This subclass is indented under subclass 500. Subject matter wherein either the head or an opposing end of the fastening means consists of a polycrystalline metallic grain structure which when subjected to an externally applied force is plastically flowable thereby producing a securing head structure or deflected end structure.
- SEE OR SEARCH CLASS:  
470, Threaded, Headed Fastener, or Washer Making: Process and Apparatus, subclasses 27+ for processes of making rivets.
- 502 Plural end legs:**  
This subclass is indented under subclass 501. Subject matter wherein the fastening means is provided with plural plastically flowable or deflectable ends.
- 503 Sheet metal type:**  
This subclass is indented under subclass 502. Subject matter wherein the fastening means is made or formed from a planar piece of metallic material.
- 504 Solid end type:**  
This subclass is indented under subclass 501. Subject matter wherein the end is devoid of any cavity, gap or space therein.
- 505 Stay bolt:**  
This subclass is indented under subclass 504. Subject matter wherein the fastener comprises an elongated structure designed to have one end attached to a plate or wall with the opposite end attached and reenforcing a second plate or wall structure.
- 506 Both head and end flowable:**  
This subclass is indented under subclass 504. Subject matter wherein both the head and the opposing end are plastically flowable.
- 507 Domed head:**  
This subclass is indented under subclass 506. Subject matter wherein the head is in the form of a hemisphere.
- 508 Having resilient securing structure on shank:**  
This subclass is indented under subclass 500. Subject matter provided with an elastic configuration on a shank portion of the fastening means wherein the configuration is specially adapted to retain the fastening means in a secure position.
- 509 Concentric ridge or flange:**  
This subclass is indented under subclass 508. Subject matter wherein the configuration is a raised crested portion or protruding edge on and concentric to the shank portion.

**510 Plural ridges or flanges:**

This subclass is indented under subclass 509. Subject matter provided with two or more raised crested portions or protruding edges.

**511 FASTENER SECURING ELEMENT:**

This subclass is indented under the class definition. Subject matter drawn to element structure for use with fasteners or fastener elements of this class and wherein either the element structure operates by inherent resilience of at least a portion of its structure or is in the form of a relatively short piece of wire having a semicircular cross section.

**SEE OR SEARCH CLASS:**

301, Land Vehicles: Wheels and Axles, subclass 111.01 for fastener securing elements specially adapted for or with land vehicle wheels or axles.

**512 Having elastomeric material:**

This subclass is indented under subclass 511. Subject matter provided with rubber or rubber-like substances having resilient properties.

**513 Cotter pins:**

This subclass is indented under subclass 511. Subject matter wherein the wire is in the form of a relatively short piece of wire having a semicircular cross section.

- (1) Note. The wire is generally folded back onto itself and is adapted to be inserted into an aperture of a headed fastener.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

96, for a threaded fastener (i.e., a bolt or nut) and means for restricting the rotation thereof relative to a coacting substructure and wherein the means includes a restricting member and further wherein the member extends between and engages a flat formed on a side of each of a plurality of bolts or nuts and additionally wherein the member has plural openings, or notches engaging the bolts, or nuts, on two sides thereof, and lastly wherein the member consists of plural parts, one of which comprises a keeper.

213, for a threaded bolt and nut and means for coupling them against rotation relative to one another and wherein the means includes a discrete, rotation restricting member which confronts an axially outwardly facing portion of the nut and further wherein the member is in the nature of a key which is movable laterally into engagement with the threaded element and additionally wherein the key includes a plastically deformable portion and lastly wherein the key is an elongated element divided longitudinally (e.g., a cotter pin, etc.).

320, for a threaded bolt and nut and means for coupling them against rotation relative to one another and wherein the means includes a member in the nature of a key which is movable laterally into engagement with the threaded elements and further wherein the key includes a plastically deformable portion and additionally wherein the key is an elongated element divided longitudinally (e.g., a cotter pin, etc.).

**514 Having deformed resilient middle portion:**

This subclass is indented under subclass 513. Subject matter wherein the wire has two legs, one having a resilient deformed portion extending transversely of the pin axis.

**515 Having folded back leg:**

This subclass is indented under subclass 513. Subject matter wherein the wire has two legs and a loop-type head and further wherein one of the legs is bent  $180^\circ$  so that the leg faces the head.

**516 Resilient metallic:**

This subclass is indented under subclass 511. Subject matter wherein the element structure is composed substantially of metallic spring material such that the element structure is at least in part retained in its securing position by the resilient nature of that material.

**SEE OR SEARCH CLASS:**

24, Buckles, Buttons, Clasps, etc., subclasses 213+ for resilient mating head and socket separable fasteners; and subclasses 255+ for resilient clasps

- not specially adapted for securing a fastener of class (411).
- 37, Excavating, subclass 457 and 458+ for resilient connections between connections between scoop buckets and teeth.
- 74, Machine Element or Mechanism, subclass 470 and 500.5+ for resilient connections in control lever and linkage systems particularly hand operated flexible systems.
- 248, Supports, subclass 74 for resilient ring, or clamp pipe, or cable supports.
- 517 Retainer ring:**  
This subclass is indented under subclass 516. Subject matter wherein the element structure is in the shape of a band.
- 518 Having gripper holes:**  
This subclass is indented under subclass 517. Subject matter wherein the element structure is provided with at least two holes to locate and coact with a tool used to assemble or disassemble the element structure.
- 519 Plural radial sectioned:**  
This subclass is indented under subclass 517. Subject matter wherein the band of material consists of at least two engageable parts.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
539+, for radially positionable washers.
- 520 Sheet metal:**  
This subclass is indented under subclass 516. Subject matter wherein the element structure is formed from a substantially flat planar piece of metallic material.
- 521 Circular:**  
This subclass is indented under subclass 520. Subject matter wherein the material is substantially in the form of a circle.
- 522 Parallel legs, e.g., U-shaped, etc.:**  
This subclass is indented under subclass 520. Subject matter wherein the planar material is folded back thereby at least producing two parallel appendages or legs.
- 523 Folded leg having fastener aperture or recess:**  
This subclass is indented under subclass 522. Subject matter wherein at least one of the folded parallel appendages is provided with an opening.
- (1) Note. The opening is generally provided to allow a portion of the headed fastener or piece to be fastened to extend there-through.
- 524 Plural folds:**  
This subclass is indented under subclass 523. Subject matter wherein the material is folded onto itself at least twice.
- 525 Having plural longitudinal slits:**  
This subclass is indented under subclass 520. Subject matter wherein the material is provided with at least two long narrow cuts both of which are parallel to the longitudinal axis of the structure.
- 526 And slit coincident with element axis:**  
This subclass is indented under subclass 525. Subject matter wherein the material is further provided with a long narrow cut lying in the longitudinal axis of the structure.
- 527 And helically inclined tongues, e.g., speed nut, etc.:**  
This subclass is indented under subclass 525. Subject matter wherein the material is formed such as to produce a pair of promontory structures having deformed edges tracing a helical path.
- 528 Having longitudinally slit coincident with element axis:**  
This subclass is indented under subclass 520. Subject matter wherein the material is provided with a long narrow cut lying in the longitudinal axis of the structure.
- 529 Having longitudinal slot forming fastener engaging slide:**  
This subclass is indented under subclass 520. Subject matter wherein the material is formed such as to have a substantially large opening confined by the outer edges of the structure, the opening being designed to physically engage the fastener or piece being secured.

**530 Wire or rod formed:**

This subclass is indented under subclass 516. Subject matter wherein the element structure is made from resilient spring wire or rod material.

**SEE OR SEARCH CLASS:**

24, Buckles, Buttons, Clasps, etc., subclasses 261+ for wire formed clasps not specially adapted for securing a fastener or fastening means of this class (411).

**531 WASHER STRUCTURE:**

This subclass is indented under the class definition. Subject matter in the form of an annular element adapted to be placed beneath the bearing surface of a bolt head, nut, or the like.

- (1) Note. The washers of this and indented subclasses are provided for sealing, reducing friction, ornamenting, etc.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

132+, for a threaded fastener (i.e., a bolt or nut) and means for restricting the rotation thereof relative to a coacting substructure and wherein the means includes a restricting member and further wherein the member or a portion thereof is located between the substructure and the inwardly facing surface of the bolt head or nut, and see especially subclasses 147+ thereunder wherein the member comprises a washer formed as a closed loop, or an apertured plate, or a split ring.

260+, for a threaded bolt and nut and means for coupling them against rotation relative to one another and wherein the means comprises a thread lock and further wherein the means includes a distortable metallic element, which element may be a washer.

270, for a threaded bolt and nut and means for coupling them against rotation relative to one another and wherein the means comprises a thread lock and further wherein the means includes a tapered surface for wedging the internally threaded element against the externally threaded one and additionally wherein the internally threaded

element is segmented and lastly wherein a member, which may be a washer, is included for carrying the tapered surface and surrounding the segmented element.

275, for a threaded bolt and nut and means for coupling them against rotation relative to one another and wherein the means comprises a thread lock and further wherein one of the elements, or a discrete member, is adapted to cant the assembly and additionally wherein a discrete member, which may be a washer, accomplishes the canting.

313+, for a threaded bolt and nut and means for coupling them against rotation relative to one another and wherein the means comprises a washer having a deformable portion engageable with one of the threaded elements.

318+, for a threaded fastener with a nut, washer, securing means, or cap, and wherein the fastener is a threaded one and is provided with a nut and further wherein a washer is included.

329+, for a threaded bolt and nut and means for coupling them against rotation relative to one another and wherein the means comprises a pawl and ratchet and further wherein the pawl is carried by a washer.

332+, for a headed fastener with a nut, washer, securing means, or cap and wherein the element which is in addition to the fastener is limited to being either a washer or a cap.

**SEE OR SEARCH CLASS:**

16, Miscellaneous Hardware, subclasses 108+ for miscellaneous ferrules, rings, and thimbles.

**532 Including release means:**

This subclass is indented under subclass 531. Subject matter wherein means are provided for permitting the element to become effectively disengaged from a fastener with which it is used without having to first remove said fastener.



**533 Including means for retaining washer to fastener:**

This subclass is indented under subclass 531. Subject matter wherein discrete means are provided for maintaining the element assembled to a fastener.

**534 Including antifriction means:**

This subclass is indented under subclass 531. Subject matter wherein the element includes means adapted to reduce the resistance to relative rotary motion between two parts of an assembly in which the element is being used.

**535 Including adjustable thickness means:**

This subclass is indented under subclass 531. Subject matter wherein means are provided for altering the axial dimension of the element.

**536 Wear or lost motion compensating means:**

This subclass is indented under subclass 535. Subject matter wherein the element includes means which automatically increases the axial dimension of the element to compensate for excessive tolerance between the parts of an assembly in which the element is used.

- (1) Note. The excessive tolerances are produced by normal bearing load wear, lost motion, etc.

**537 Having leveling means:**

This subclass is indented under subclass 531. Subject matter wherein the element includes means for compensating for differences in contour of opposing bearing surfaces on parts in an assembly in which the element is used.

**538 Inclined planar face:**

This subclass is indented under subclass 537. Subject matter wherein the compensating means on the element defines a flat, angled surface which is adapted to mate with an equally angled and oppositely extending surface on a part in an assembly in which the element is used.

**539 Radially positionable:**

This subclass is indented under subclass 531. Subject matter wherein the element includes means which permits the element to be moved laterally of a shank of a fastener with which the element is used.

**540 Pivotaly hinged sections:**

This subclass is indented under subclass 539. Subject matter wherein the means comprise plural connected segments rotatable about points where the segments are so connected.

**541 Secured by plastic deformation:**

This subclass is indented under subclass 539. Subject matter wherein the element is altered in shape after being positioned about a shank of a fastener.

**542 Sealing:**

This subclass is indented under subclass 531. Subject matter wherein the element serves to prevent the ingress of fluids between a fastener with which it is used and an adjacent part.

**SEE OR SEARCH CLASS:**

- 277, Seal for a Joint or Juncture, for a generic sealing means or process, subclass 640 for a static contact seal for other than an internal combustion engine, or a pipe, conduit, or cable including an anchoring means extending through the seal.
- 292, Closure Fasteners, subclass 307 for closure seal structure.

**543 Wire formed:**

This subclass is indented under subclass 531. Subject matter wherein the element is fabricated from an elongated piece of metal stock having a circular cross section.

**544 Axially resilient:**

This subclass is indented under subclass 531. Subject matter wherein the element is composed of elastic material and configured such that it can be axially compressed and will tend to return to its original shape.

**545 Corrugated:**

This subclass is indented under subclass 531. Subject matter wherein the element is formed with folds defining a series of alternating grooves and ridges on the opposed faces thereof.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 161, for a washer having ridges or grooves extending more or less radially across

its axially facing surfaces, and wherein the washer is disclosed as being a component of a bolt-to-substructure, or a nut-to-substructure, locking arrangement.

**546 Spacer:**

This subclass is indented under subclass 531. Subject matter wherein the element is in the form of a cylinder and is used to maintain parts of an assembly in spaced relationship.

**547 Of folded sheet material:**

This subclass is indented under subclass 546. Subject matter wherein the element is formed of initially thin flat stock material, which is rolled or otherwise shaped into a generally cylindrical configuration having an axially directed opening therethrough.

**548 MISCELLANEOUS:**

This subclass is indented under the class definition. Subject matter not provided for elsewhere.

**549 Outwardly extending projection cooperates with socket member having ramp engagement means:**

This subclass is indented under subclass 349. Subject matter wherein a portion of the securing means protrudes from the headed elongated fastening means shank along a line substantially perpendicular to the longitudinal axis of the headed fastening means and wherein the securing means further includes a socket member having in the form of a ramp surface adapted to mate with protruding portion.

**550 Including means providing axial adjustment:**

This subclass is indented under subclass 549. Subject matter wherein the headed elongated fastening means or the means allowing the axial dimension between the head of the headed elongated fastening means and the surfaces on the socket member to be altered.

**551 Threaded adjustment:**

This subclass is indented under subclass 550. Subject matter wherein the adjustment means are in the form of threaded surfaces.

**552 And discrete biasing spring:**

This subclass is indented under subclass 549. Subject matter wherein separate means are provided for resiliently urging the securing means and the cooperating socket member in axially opposed direction to enhance the engagement therebetween.

**553 Similar, opposed ramp surfaces:**

This subclass is indented under subclass 549. Subject matter wherein the ramp surfaces extend in a rectilinear manner on diametrically opposite sides of the headed elongated fastening means.

**554 Helically slotted securing means having cooperating engaging portion on socket member:**

This subclass is indented under subclass 349. Subject matter wherein the securing means comprises an arcuate recess in the headed elongated fastening means shank which is generally spirally oriented about the axis thereof and wherein a mating to cooperate with the recess.

**555 Through-slot for engagement with crossbar:**

This subclass is indented under subclass 554. Subject matter wherein the recess extends transverse to and entirely through the shank of the headed elongated fastening means and the cooperating structure on the socket member comprises a rod entirely transversing a shank receiving opening in the socket member.

**CROSS-REFERENCE ART COLLECTIONS**

The patents in the following collections have been placed without regard to their original classification or to their claimed subject matter and are therefore not exhaustive of the art subject matter but are only example of the art.

**900 FASTENER OR FASTENER ELEMENT COMPOSED OF PLURAL DIFFERENT MATERIALS:**

Art collection of fasteners or fastener elements made of plural distinct substances.

**901 Core and exterior or different materials:**

Art collection of fastener or fastener elements in which the interior and exterior portions are made of distinct different substances.

- 902 Metal core:**  
Art collection of fasteners or fastener elements having a metallic core.
- 903 Resinous exterior:**  
Art collection of fasteners and fastener elements having a metal core and a resinous exterior.
- 904 Fastener or fastener element composed of nonmetallic material:**  
Art collection of fasteners and fastener elements made of materials other than metal.
- 905 Paper or wood:**  
Art collection of fasteners or fastener elements composed of cellulose material.
- 906 Leather or fabric:**  
Art collection of fasteners and fastener elements made of a tanned or otherwise skin of an animal or of a woven, knitted, or felted cloth.
- 907 Elastomeric:**  
Art collection of fasteners or fastener elements composed of a rubber or rubberlike substance.
- 908 Resinous material:**  
Art collection of fasteners or fastener elements composed of a polymerized synthetic or chemically modified resin.
- 909 Fasteners or fastener elements composed of thermo-responsive memory material:**  
Art collection of fasteners or fastener elements composed of an alloy comprising materials having different coefficients of expansion whereby the fastener or element is capable of changing first from one configuration at a temperature to another configuration at a second temperature by subjecting the fastener or element to the second temperature.
- 910 Anti-tamper means:**  
Art collection of fasteners or fastener elements which includes means for preventing unauthorized removal thereof.
- 911 One-way drive:**  
Art collection of fasteners or fastener elements wherein the anti-tamper means includes tool engaging surfaces permitting rotation of the fastener in the direction of insertion but does not include surfaces facilitating rotation in the direction of removal.
- 912 ANTI-SPLITTING FASTENER:**  
Art collection of fasteners or fastener elements provided with means to prevent the material into which the fastener or element is driven from splitting.
- 913 SELF-EXPANDING ANCHOR:**  
Art collection of self-expanding anchors designed to be inserted into an opening of a part wherein an anchor is provided with flexible legs of inherently resilience, the legs being radially inwardly compressible to permit insertion in the opening and radially outwardly moveable upon release of the compressive force to thereby engage the wall of the opening or a distal face of the part.
- 914 COATED BOLT:**  
Art collection of bolt fasteners designed either to be passed through two or more pieces to be secured together and having a separate blocking device, e.g.; a nut, or those having a threaded or otherwise configured shank which engages a corresponding prepared recess in one of the pieces to be secured wherein a bolt fastener is provided with a coating.
- 915 BOLT HAVING PACKING JOINT:**  
Art collection of bolt fasteners designed either to be passed through two or more pieces to be secured together and having a separate locking device, e.g., a nut, or those having a threaded or otherwise configured shank which engages a corresponding prepared recess in one of the pieces to be secured and further wherein a bolt fastener is provided with a packing joint.
- 916 BOLT HAVING TENSION FEATURE:**  
Art collection of bolt fasteners designed either to be passed through two or more pieces to be secured together and having a locking device, e.g., a nut, or those having a threaded or otherwise configured shank which engages a corresponding prepared recess in one of the pieces to be secured and further wherein a bolt fastener is provided with a tension feature.
- 917 NUT HAVING TENSION FEATURE:**  
Art collection of nut fasteners designed to be attached to the ends of bolts having an opening which is either to correspond to the thread of a

- bolt or other similar corresponding structure to secure the bolt in place in the material to which it is applied and further wherein a nut fastener is provided with a tension feature.
- 918 THREADLESS NUT:**  
Art collection of nut fasteners designed to be attached to the ends of bolt having an opening wherein a nut fastener is provided with a cooperating structure to secure the bolt in place in material to which is applied by means other than an internal thread of the nut fastener.
- 919 SCREW HAVING DRIVING CONTACTS:**  
Art collection of screw fasteners which have a shank provided with threads adapted to produce a corresponding internal thread in material into which a screw fastener is inserted and provided with a head having means allowing the screw fastener to be engaged by a rotating device, the means being in the form of nicks, an angular head, or projecting ribs specially adapted to be engaged by a corresponding shaped driver to rotate the screw fastener.
- 920 STAPLE:**  
Art collection of double pointed staple fasteners substantially U-shaped and usually having legs of equal length designed to span and hold into place a separate piece or article wherein the legs pierce the material on opposite sides of the piece or article to be held.
- 921 MULTIPLE-PRONGED NAIL, SPIKE OR TACK:**  
Art collection of nail, spike or tack fasteners designed to be driven by repeated blows or by nailing machines and laterally displacing materials into which they are forced to thereby be retained either by friction, clenching, or additionally locking means wherein a nail, spike or tack fastener is provided with two or more prongs and further wherein the prongs of fastener are designed to enter material at or near the same point and to be distinguished from staples in that they are not adapted to span and secure between two of holding points and a separate piece of material.
- 922 NAIL, SPIKE OR TACK HAVING LOCKING DEVICE:**  
Art collection of nail, spike, or tack of fasteners designed to be driven by repeated blows or by nail machines and laterally displacing material into which they are forced to thereby be retained by friction, clenching, or blocking means in which a nail, spike, or tack fastener is provided with a device attach to or made integral with the fastener to prevent or render difficult its withdrawal.
- 923 NAIL, SPIKE OR TACK HAVING SPECIFIC HEAD STRUCTURE:**  
Art collection of nail, spike or tack fasteners designed to be driven by repeated blows or by nailing machines and laterally displacing the material into which they are forced to be retained by friction, clenching, or additionally locking means and in which significance is attributed to the head structure of a nail, spike, or tack fastener.
- 924 COUPLED NUT AND BOLT:**  
Art collections of assembled fasteners in the form of threaded nuts and bolts provided with special structures designed to prevent, or tending to prevent the rotation of a threaded nut and bolt, or relative rotation of a threaded nut and bolt, or endwise movement or separation of a threaded nut and bolt.
- 924.1 Deformed:**  
Art collection under are collection 924 in which either a nut or bolt is deformed.
- 925 Top stop:**  
Art collection under art collection 924 in which a special structure is provided in the form of a stop secured or locked to the bolt and in which the stop has a portion above the nut which locks the nut.
- 926 Positive lock:**  
Art collection under art collection 925 in which the stop prevents rotation of the nut on the bolt by a positive interlocking engagement with the nut.
- 927 Side:**  
Art collection under art collection 926 in which the nut is locked by a portion of the stop engaging a side of the nut.
- 928 Thread Gripper:**  
Art collection under art collection 925 in which the stop is locked to the bolt by its gripping action on the bolt threads.

**929 Thread lock:**

Art collection under art collection 924 in which the nut is locked to the bolt directly or indirectly by the action upon the threads.

**929.1 Coil Spring:**

Art collection under art collection 929 in which a nut or bolt are provided with a coil spring to lock the nut to the bolt.

**929.2 Distorted washer:**

Art collection under art collection 929 in which a nut and bolt are provided with a distorted washer to lock the nut to the bolt.

**930 Flowing metal or settable material:**

Art collection under art collection 929 in which the locking action between the nut and bolt is accomplished either by (a) melted metal or other material capable of harding into a solid state (e.g., cement), or (b) a part plastically formed by either the bolt shank, or the nut into which the shank is threaded, thereby coating between the threads of the shanks or those on the nuts to prevent relative rotation.

**931 Superposed Nuts:**

Art collection under art collection 929 in which more than one nut is placed on a bolt wherein the other nut having some special construction or adjunct whereby it is adapted to lock the other nut.

(1) Note. Jam-nuts are included only when they are especially adapted to serve as jam-nuts.

**932 Oppositely threaded:**

Art collection under art collection 931 in which one nut has a right hand thread and the other nut has a left hand thread and the threads cooperating with a similarly threaded bolt.

**933 Key or pawl locked:**

Art collection under art collection 932 in which the nuts are locked together by a key or a pawl and ratchet mechanism.

**934 Side locked:**

Art collection under art collection 933 in which the nuts are locked together by a device engaging their sides.

**935 Cam or cone grip:**

Art collection under art collection 929 in which the threads of the bolt are gripped by a cam action between the nut or washer or another part or by the action of a cone and its collecting member forcing a part of the nut or washer against the bolt threads.

**935.1 Cam:**

Art collection under art collection 935 wherein the threads of the bolts are gripped by a cam action between the nut and washer and other parts.

**936 Canted nut:**

Art collection under art collection 929 in which the nut at its final position tends to bend the bolt at the base of the nut.

(1) Note. Usually the nut or the washer is wedge shape.

**937 Distorted nut:**

Art collection under art collection 929 in which either the whole or a part of the nut is distorted or changed in shape before, during, or after its application to the bolt, so that the threads of the nuts grip the threads of the bolt.

**937.1 Predistorted thread pitch or diameter:**

Art collection under art collection 937 in which either the thread pitch of the nut or the diameter of the nut is distorted prior to the assembly of the nut to the bolt.

**937.2 Post-distorted thread pitch or diameter:**

This subclass is indented under subclass 937. Art collection of fasteners in which either the nut thread pitch or its diameter is distorted after the nut has been applied to the bolt.

**938 Distorted thread:**

Art collection under art collection 929 in which the threads of the nut or bolt are during or after the application of the nut bent, crushed, or injured, so as to lock the nut and bolt from relative rotation.

**939 Longitudinal key:**

Art collection under art collection 929 in which a special structure is provided in the form of a key having its locking portion extending longi-

- tudinally of the bolt and biting or bending against the thread.
- 940 Radial key or gib:**  
Art collection under art collection 929 in which a special structure is provided in the form of a key or gib which is moved radially toward the bolt and engages its thread.
- 941 Side clutch:**  
Art collection under art collection 929 in which a special structure is provided in the form of a device, not an integral part of the nut or bolt, which clutched or bites the threads of the nuts or bolt.
- (1) Note. The locking action in most cases resemble that of the pawl and ratchet, except the part engaged by such device has no cooperating notches.
- 941.1 Spring:**  
Art collection under art collection 941 in which the device is in the form of a spring.
- 941.2 Roller:**  
Art collection under art collection 941 in which the device is in the form of a roller.
- 941.3 Ball:**  
Art collection under art collection 941 in which the device is in the form of a ball.
- 942 Tangential key:**  
Art collection under art collection 929 in which a special structure is provided in the form of a key in the nut which moves tangentially to the bolt and bites or binds against the threads thereof.
- 943 Flexible washer:**  
Art collection of fasteners under art collection 924 in which the fastener is provided with a washer secured to the bolt which washer has an interlastic portion turn against the nut after the nut is screwed on.
- 944 Flexible key:**  
Art collection under art collection 924 in which the nut and bolt are held together by a key which is bent after the nut is seated as to form a connection between notched or slots in the nut and bolt.
- 945 Cross key:**  
Art collection under are collection 924 in which the nut and bolt are lock together by a key which has its locking position lying transversely of the bolt.
- 946 Spring-seated:**  
Art collection under art collection 945 in which the key is forced to its seat by a spring.
- 947 Elastic-gripping action:**  
Art collection under art collection 924 in which the nut or a provided washer is composed wholly or partly of elastic material which grips the threaded or other part of the bolt.
- 948 Longitudinal key:**  
Art collection under art collection 924 in which the nut and bolt are locked together by a key whose locking portion extends longitudinally of the bolt.
- 949 Ratchet and bolt-carried pawl:**  
Art collection under art collection 924 in which a nut and bolt are interlocked by a pawl and ratchet mechanism which automatically locks the nut or bolt from movement in one direction but permits free movement in the other and further wherein the bolt carries or holds from rotation a pawl which interlocks with a ratchet teeth in the nut.
- 950 Ratchet and nut-carried pawl:**  
Art collection under art collection 924 in which a nut and bolt are interlocked by a pawl and ratchet mechanism which automatically locks the nut or bolt from movement in one direction but permits free movement in the other and further wherein the nut carries the pawl which rotates with the nut and interlocks with ratchet teeth on the bolt.
- 951 Flexible:**  
Art collection under art collection 950 in which a flexible pawl interlocks with ratchet teeth carried by bolt or by a structure secured to the bolt.
- 952 Pivoted.**  
Art collection under art collection 950 in which the pawl carried by the nut moves on a pivot to lock and unlock.

**953 Washer-carried pawl:**

Art collection under art collection 924 in which a nut and bolt are interlocked by a pawl and ratchet mechanism which automatically locks the nut or bolt from movement in one direction but permits free movement in the other and further wherein a washer is secured to the bolt and carries a pawl which interlocks with a special made ratchet surface of the nut.

- (1) Note. The corner of the ordinary nut are not regarded as forming a ratchet surface.

**954 Wedged slotted bolt:**

Art collection under art collection 924 in which the bolt has a slit or slot in which a wedge shape device moves to cause the bolt section to expand against the nut.

- (1) Note. The wedge type device may be removable from the bolt.

**955 LOCKED BOLTHEAD OR NUT:**

This subclass is indented under the class definition. Art collection wherein a bolthead or nut, hereinafter call a device, is fastened to an element, hereinafter called a substructure, so as to prevent rotation of the device.

- (1) Note. A fastening means may be part of the device or the substructure or it may include additional elements.

**956 Automatic base clutch:**

Art collection under art collection 955 wherein a face of the device adjacent the substructure is gripped thereto by the turning of the device into fastening position.

**957 Biting tooth:**

Art collection under art collection 956 wherein the gripping is affected by one or more projection deforming the surface of the substructure or the device.

**958 Coiled washer:**

Art collection under art collection 957 wherein the projections are carried by a washer which is not a closed annulus, surrounding the bolt shank.

**959 Bolt-or nut-carried:**

Art collection under art collection 957 wherein the projections are carried by the face of the device adjacent the substructure of the device, or by the bolt shank

**960 Friction:**

Art collection under art collection 956 wherein the device is held from rotation solely by the pressure between the substructure and the face of the device adjacent thereto.

**961 Pawl and ratchet:**

Art collection under art collection 956 wherein a resiliently urged dog locks the device against movement in one direction permitting free movement in another.

**962 Bolthead or nut-carried pawl:**

Art collection under art collection 961 wherein the dog is carried by the device and locks underneath the face adjacent the substructure.

**963 Yielding interlocking washer:**

Art collection under art collection 961 wherein the device has a tooth face adjacent the substructure which interlocks with a resilient washer carrying complimentary teeth.

**964 Detent:**

Art collection under art collection 956 wherein the interface of the device and either the substructure, or a washer mounted between the device and the substructure is provided with coacting means which are resiliently held interengage, but permit force relative turning in either direction.

**965 With retainer:**

Art collection under art collection 955 wherein the device has means other than cooperating threads on either the nut or substructure and the bolt to prevent its displacement from operative position on the substructure.

**966 Multiple (i.e., gang type):**

Art collection under art collection 965 wherein a plurality of devices are held by a single means.

**967 Deformable bolthead or nut:**

Art collection under art collection 965 wherein a portion of the device is changed in shape to

- contact the substructure and thereby prevent the separation of the device therefrom.
- 968 Deformable base member:**  
Art collection under art collection 965 wherein the substructure is changed into shape to prevent the separation of the device therefrom.
- 969 Deformable retainer:**  
Art collection under art collection 965 wherein in a separable holder is changed in shape to prevent the separation of the device from the substructure.
- 970 Resilient retainer:**  
Art collection under art collection 965 wherein a holder has yieldable part coacts with the substructure to prevent the separation of the device with the substructure.
- 971 And side lock:**  
Art collection under art collection 965 wherein a side surface of the device is locked to prevent rotation.
- 972 Distorted:**  
Art collection under art collection 955 wherein the device is locked by deforming a portion thereof to engaged the substructure.
- 973 Gravity bolthead, nut or washer:**  
Art collection under art collection 955 wherein (a) the device is heavier on one side than the other, or (b) the device is seated in or carried by a washer heavier on one side than on the other.
- 974 Side lock:**  
Art collection under art collection 955 wherein an exterior sides surface of the device is locked to prevent rotation.
- 975 Rotatable washer:**  
Art collection under art collection 974 having a washer which turns with the device as single piece, the locking action taking place between the washer and the substructure.
- 976 Bent tongue-locked:**  
Art collection under art collection 975 wherein the washer is locked to a side surface of the device and a nonelastic washer portion is deformed to engage a portion of the substructure.
- 977 Pawl-locked:**  
Art collection under art collection 975 wherein the washer and the substructure are interlocked by a resilient dog which locks the device in movement in one direction, permitting free movement in the other.
- 978 Pawl and ratchet:**  
Art collection under art collection 974 wherein the device is locked by a resilient dog against movement in one direction, permitting free movement in the other.
- 979 Resilient:**  
Art collection under art collection 974 wherein the locking means has a part which is yieldable to permit rotation of the device.
- 980 Automatic:**  
Art collection under art collection 979 wherein the locking mechanism engages and locks by the mere rotation of the device to the fastening position.
- 981 Coiled washer:**  
Art collection under art collection 980 wherein the device is locked by a washer coiled about the device and having a portion engaging a side surface of the device.
- 982 Spring-tongued washer plate:**  
Art collection under art collection 980 having a washer or plate, and one or more resilient dogs or tabs engaging the side surface of the device.
- 983 Inelastic tongue:**  
Art collection under art collection 974 having an element mounted between the inner face of the device and the substructure with a deformable portion bent against the side of the device after it is turned to the fastening position.
- (1) Note. The element must lock the device which is directly seated thereon.
- 984 Longitudinal:**  
Art collection under art collection 974 wherein the locking mechanism is brought to locking position by a final movement longitudinally of the bolt after the device is turned to the fastening position.



- (1) Note. The final locking position alone is considered whatever previous movement the device is received.
- 985 Bolthead- or nut-held:**  
Art collection under art collection 984 in which the locking mechanism is held in place by the device alone.
- 986 Reversed bolthead or nut:**  
Art collection under art collection 985 in which the device is locked by a backward, unfastening turn after moving to the fastening position.
- 987 Side pin:**  
Art collection under art collection 984 wherein a pin seated in the substructure is moved longitudinally of the bolts so as to stand against a side thereof.
- (1) Note. The side may have a groove for the reception of the pin.
- 988 Spike-held locking plate:**  
Art collection under art collection 984 in which the locking mechanism is of sheet form and is held against the device by a nail or other driven fastener extending into the substructure.
- 989 Swinging:**  
Art collection under art collection 984 wherein the locking mechanism is pivoted to a locking position against the side surface of the device.
- 990 Washer tongue-held:**  
Art collection under art collection 984 wherein the locking mechanism is held in position by an integral portion of a washer which, in locking position, extends above a portion of the device.
- 991 Transversely sliding:**  
Art collection under art collection 974 wherein the locking mechanism is finally reciprocated substantially parallel to the surface of the substructure after it is turned to the fastening position so as to lock a side surface of the device.
- 992 Key, plate, or bar:**  
Art collection under art collection 991 wherein the locking mechanism is a rod or thin member which passes astride or on one side of the device, parallel to the surface of the substructure.
- 993 Bolthead- or nut-held:**  
Art collection under art collection 992 wherein the locking mechanism is held in place by the device.
- 994 Sliding washer:**  
Art collection under art collection 992 wherein the locking mechanism is a washer which is reciprocated to locking position after the device is seated, the washer having a stop to lock the side surface of the device.
- 995 Transversely swinging:**  
Art collection under art collection 995 wherein the locking mechanism pivots on an axis parallel to the axis of the bolt so as to engage the side surface of the device.
- 996 Transverse base-locking key:**  
Art collection under art collection 955 wherein a key extends substantially parallel to the surface of the substructure between the base of the device and the substructure.
- 997 Longitudinal fastener:**  
Art collection under art collection 955 wherein means, parallel to the axis of the bolt, extends through the device and into the substructure to hold the device from rotation.
- 998 WITH POSITIVE BOLT LOCK:**  
This subclass is indented under the class definition. Art collection for fixedly, i.e., nonfrictionally, fastening a bolt from rotation.
- 999 WITH RETAINER (E.G., TETHER):**  
This subclass is indented under the class definition. Art collection wherein a mass, other than the cooperating threads on the bolt-shank or the nut or substructure, is provided to prevent complete separation or loss of an assembled bolt, nut and substructure, as, e.g., by tethering means, or prevent their axial or endwise separation while permitting rotation.
- (1) Note. The retainer does not prevent the rotation of the bolt or nut and may even allow its complete withdrawal, the retainer merely preventing the bolt or nut from being lost by means as, e.g., a flexible connector.

END